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HOW ARE THE POOR AFFECTED BY INTERNATIONAL TRADE IN INDIA

An empirical approach

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Abbreviations

ASI	Annual Survey of Industries
AWI	Agricultural Wages in India
CAGR	Compounded Annual Growth Rate
DME	Directory Manufacturing Establishment
DPD	Dynamic Panel Data
expint	Export Intensity
GDI	Gender Development Index
GLS	Generalized Least Squares
GMM	Generalized Method Of Moments
GVA	Gross Value Added
H-O	Hecksher-Oklin
HS	Harmonized System
impint	Import Intensity
K/L	Capital Labour Ratio
lp	Labour Productivity
MP_L	Marginal Product of Labour
MRP	Mixed Recall Period
NCEUS	National Commission for Enterprises in the Unorganized Sector
NDME	Non-Directory Manufacturing Establishment
NIC	National Industrial Classification
NPC	Net Protection Coefficient
NSS	National Sample Survey
OAME	Own Account Manufacturing Enterprise
OLS	Ordinary Least Squares
PFCE	Private Final Consumption Expenditure
QRs	Quantitative Restrictions
SAM	Social Accounting Matrix
SDP	State Domestic Product
StateDum	State Dummy
stateor	States' Export Orientation
URP	Uniform Recall Period
WITS	World Integrated Trade Solution
wrate	Wage Rate
2SLS	Two-Stage Least Squares

Executive summary

The growing volumes of international trade and lowering of tariff barriers have triggered continuing debate and analysis on the impact of international trade on poverty. On the one hand, there are scholars, policymakers and international organizations who argue that international trade provides opportunities to developing and least developed countries by expanding their markets, infusing new technologies and improving productivity, which leads to their overall growth. On the other hand, others have pointed out the complexities involved in the mechanism through which international trade may alleviate poverty. It has been argued that international trade may not necessarily lead to growth, and even if it does, the trickle-down effect from growth to poverty reduction is based on the assumption that economic growth is distribution-neutral, which may not be true in many cases. In the alternative, some argue that the more inequitable the distribution of incomes, the higher the growth will be. The United Nations has identified eradication of poverty – especially of extreme poverty – as its number one Millennium Development Goal (MDG). It has further underlined that global partnership, including through international trade (MDG 8), can contribute to promoting development and eradicating poverty.

In the context of the existing debate, this study takes an alternative approach to the issue of impact of international trade on poverty. Instead of estimating the net impact of international trade on poverty, an attempt has been made to assess how the poor are affected by international trade. The poor constitute the low-income group. International trade may produce both winners and losers. This approach does not attempt to arrive at the net impact of international trade on poverty. It may not be desirable to compare the gains to losses, as losses may occur to relatively poorer sections of society and gains to relatively well-off sections, or vice versa.

The framework of the study involves tracing the role played by international trade in influencing the four facets of human development, namely ***empowerment, productivity, equity and sustainability***. An extensive exploration is conducted in each of these issues to trace the role played by international trade in the livelihoods of the poor.

Empowerment

- The study conducts an impact assessment to examine whether trade has empowered the poor in terms of generating additional employment in the economy whereby more people are employed. The study estimates the extent of employment generated in 46 subsectors of the economy due to increase in exports from 2003-04 to 2006-07. ***The study finds that a rise in exports in the period 2003-04 to 2006-07 increased employment by 26 million person years.*** Additional employment of 6 million was generated in agriculture, which has the maximum number of poor.

- In the unorganized sector, which employs more than 80% of the total Indian workforce, the study estimates the impact of trade on employment and the wage rates paid by enterprises. Results show that ***in the unorganized sector, enterprises belonging to export-oriented industries employ more people and pay higher wages***. However, it is only the relatively bigger enterprises (i.e. those that employ more than six workers) that gain most from the export orientation of the industry. Rising import competition is found to have adversely affected employment in these enterprises. The location of an enterprise, in terms of the state to which it belongs, has an important bearing on the impact of trade. Irrespective of the export orientation of the industry, unorganized enterprises in states with higher estimated export orientation are found to gain more from exports, while the impact of import competition does not vary across states. ***Statistically significant results with respect to exports increasing employment in the unorganized sector are found in Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Punjab and Tamil Nadu***.

- Focusing on the agriculture sector, the study estimates the impact of exports and imports on the wages of unskilled labour in agriculture and organized manufacturing. The results show that exports of agricultural products have not led to increases in the wage rates of unskilled workers, but ***imports of agricultural products have led to a lowering of the wage rates of unskilled workers in agriculture.***

- In the organized manufacturing sector, the results indicate that exports have had a favourable impact on the wages of unskilled labour. ***Strict labour laws and downward rigidity of wages in India have perhaps prevented rising import competition from displacing unskilled labour or adversely affecting their wage rates***.

- It has been often argued that gains from trade are not gender-neutral and that women tend to gain less than men. An in-depth analysis has been undertaken to estimate the impact of trade in gender employment. ***The results show that the increase in exports in the period 2003-04 to 2006-07 generated 9.38 million employments for women and 16.60 million for men. The share of females in additional employment generated due to the increase in exports exceeds the share of females in total employment by nearly 5 percentage points. This suggests that the increase in exports has reduced the gap between male and female employment in India***. This result is corroborated by the estimations carried out for the organized manufacturing sector, which show that export intensity has a positive and significant impact on women's employment but that imports have not led to any displacement of women's employment.

Productivity

- An important aspect of trade liberalization is to induce competition to increase productivity levels. Studies have found that as firms are exposed to international competition (through exports) and domestic competition (through imports), labour productivity rises. However, most of the studies have been carried out for the organized manufacturing sector. This study estimates the impact of trade on labour productivity in both the organized and the unorganized manufacturing sector. Further, the impact of trade on the labour productivity of both skilled and unskilled labour is carried out separately.

- The results show that in the unorganized sector, ***the export intensity of the industry to which an enterprise belongs has a significant positive impact on its labour productivity, but that conversely, import intensity reduces labour productivity***. However, these effects are mainly experienced by enterprises with more than six workers. In the organized sector, the study finds that both export and import competition improves labour productivity. This has an important implication – ***competition can have productivity enhancement effects only after an enterprise achieves a certain threshold scale of production***. Higher competition, whether domestic or international, may in fact lower the productivity levels of very small enterprises.

Equity

- Whether trade-induced growth is accompanied by higher/lower inequality is an important issue. Most of the earlier studies for India have examined this issue by comparing indicators of inequality, e.g. Gini coefficients, in the pre- and post-liberalization period. However, this approach is unable to establish whether trade is the cause for rising/falling inequality. This issue is approached in this study by comparing the gains from trade across different income groups and segmented labour markets.

- The study estimates the incomes generated due to increased exports for people in abject poverty and for those below the poverty line. The results of the study show that the total income generated by the increase in exports in the period 2003-04 to 2006-07 has been of Rs 2,364 billion, equivalent to $55 billion. ***However, the total income generated for the people in the lowest income group (i.e. people in abject poverty and those below the poverty line) is only around 1.6% of the total income generated*** in the economy by the increase in exports in the period 2003-04 to 2006-07. The poor have benefited from exports, but the gains have been unevenly distributed, with 70% of the income generated going to the top two income groups.

- The results of the study indicate that although exports have increased the wage rates of unskilled labour, they have led to a faster rise in the wages

of skilled labour. ***This implies that exports have led to higher wage inequality between skilled and unskilled labour***.

Sustainability

- To sustain the gains from trade, it is important that the gains are widespread and affect different sections of society. The study estimates the impact of trade on gender employment in the organized manufacturing sector.

- Furthermore, it identifies ***gender-sensitive products,*** which may form a practical basis for gender sensitization of trade policy.

- The study estimates job losses across sectors during the period of the global slowdown (i.e. 2007-08 to 2008-09). This provides important insights for identifying vulnerable sectors and adopting suitable mitigating strategies.

- It also derives policy implications for making international trade work for poor.

This study is a pioneering study in four major respects. ***Firstly***, earlier studies on the impact of international trade on employment and wages have been at a disadvantage in terms of lack of trade data at the industry level. To address this concern, the study constructs a concordance matrix between six-digit product-level data (2002 Harmonized System of Coding) and three-digit industry-level data (National Industrial Classification). Using this concordance matrix, the exports and imports of products have been matched to the respective industries to arrive at industry-level trade data. The industry-level trade data are used for estimating the impact of exports and imports on different aspects of the labour market.

Secondly, the study looks at the impact of export intensity of industries, and import competition faced by the industries in the organized sector, on employment, wage rates and the labour productivity of enterprises in the unorganized sector. This traces an important channel through which the effects of trade can percolate to the poor.

Thirdly, the study uses similar methodology to estimate the impact of international trade in different sectors of the economy in the same period. Similar labour demand and wage equations across sectors have been estimated. This makes comparison of trade-related effects across sectors possible, which may be extremely useful in cases of trade policy formulation, where it is imperative to understand the implications of trade policies across sectors.

Finally, the study estimates the extent to which exports in the period 2003-04 to 2006-07 have generated employment in 46 subsectors of the economy and incomes for people in abject poverty and those below the poverty line. The employment

generated is also disaggregated into employment created for men and women separately. Further, the impact of the global slowdown on employment has been quantified.

The key messages of the study are the following:

- **Exports have generated additional employment and incomes in the economy, but these gains have not trickled down to the poor. For the poor to benefit from international trade, it is important to increase their participation in the sectors that are expanding on account of trade. One plausible way of directly linking the poor to trade could be to identify the products produced by the poor or those that have greater numbers of poor people involved, and enhance their exports so that the benefits go directly to the poor.**
- **The unorganized sector in India acts as a safety valve for absorbing excess employment in the economy. The impact of trade on wages and employment in the unorganized sector can have far-reaching implications for how the poor are affected by trade. In order to absorb excess labour through higher exports and to minimize displacing labour through higher imports, it becomes vital to develop strong linkages between the organized and unorganized sectors in the economy.**
- **The pro-poor impact of international trade in terms of higher wages and employment of unskilled labour is more prominent in the organized manufacturing sector as compared to the unorganized sector. Minimum wages and rigid firing policies in the organized sector have, to some extent, enabled unskilled workers to benefit from trade. However, in order to increase the gains of the poor from trade, it is important to improve their skills and bargaining power. It is also important to keep a check on increasing wage inequality between white-collar and blue-collar workers.**
- **For all sections of the economy to benefit equitably from trade, it is important to have gender-equitable distribution of the gains of trade. Export-oriented policies can be an important instrument in the hands of policymakers for gender empowerment. However, for this to happen, gender sensitization of trade policy is required. Gender-sensitive products need to be identified and a cautious approach should be adopted with respect to promoting exports of these products and ensuring that imports do not displace domestic production of these products. Higher education for women, and enhancement of their skills, can help women in gaining a greater share of trade-generated employment.**

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CHAPTER I

INTRODUCTION

1.1 How are the poor affected by trade: Conceptual framework

Growing volumes of international trade coupled with a lowering of tariff barriers have triggered continuing debate on the impact of trade on poverty. On the one hand, there are scholars who argue – using the conventional theories of trade – that trade provides opportunities by expanding markets, infusing new technologies, and improving productivity, which leads to overall growth. Further, in labour-abundant developing countries, higher exports increase demand and wages of low-skilled workers. Since low-skilled workers are most likely to be in a situation of poverty, higher exports lead to reductions in poverty. Some have also argued that trade helps in poverty reduction, as developing countries pursuing an export-promoting strategy will have to maintain macroeconomic stability. This reduces inflation fluctuations, to which the poor are most vulnerable. Therefore, greater orientation towards trade encourages countries to adopt macroeconomic policies, which invariably favour the poor.[1]

On the other hand, scholars have pointed to the complexities involved in the mechanism through which trade may affect poverty. To trace the impact of trade on poverty, the role of specialization, intra-industry trade and perfectly elastic supply of labour has been brought to the forefront. It has also been argued that the trickle-down effect from growth to poverty reduction is based on the assumption that economic growth is distribution-neutral, if not distribution-improving, which may not be true in many cases. Further, the debate on the trade–poverty nexus has become more complex due to the methodological issues and data limitations. UNCTAD – the focal point of the United Nations for the integrated treatment of trade and development and interrelated issues in the areas of finance, technology, investment and sustainable development – has examined the linkages between trade, development and poverty alleviation, and how this has been affected by changing global economic conditions. For example, following the global food, fuel, financial and economic crises, UNCTAD has analysed the impact on trade and poverty, and has identified policy changes and adaptations to development strategies to ensure a revival in trade in a manner that creates jobs, alleviates poverty, and widens access to essential services, especially in developing countries.[2]

[1] See Bhagwati and Srinivasan (2002)
[2] See UNCTAD (2010).

In the context of the existing debates, this study takes an alternative approach to the issue of the impact of trade on poverty. Instead of estimating the net impact of trade on poverty, an attempt has been made to assess how the poor are affected by trade. The poor constitute the low-income group. Trade may produce both winners and losers; it may not be desirable to compare the gains to losses, as losses may occur to relatively poorer sections of society and gains to relatively well-off sections, or vice versa. Pursuing this line of argument, this approach focuses on how the livelihoods of the poor are affected by international trade.

The framework of the study involves tracing the role played by trade in influencing the four facets of human development, namely ***empowerment, productivity, equity and sustainability***. An extensive exploration is conducted in each of these issues to trace the role played by trade.

Empowerment of the poor

✦ The study conducts an impact assessment to examine whether trade has empowered the poor in terms of generating additional employment in the economy. Exports can generate employment directly because of increases in output in the exportable sector, and indirectly by increasing the output of sectors, which provide inputs and services to the exportable sectors. The study estimates the extent of employment generated in 46 subsectors of the economy due to increases in exports from 2003-04 to 2006-07. The study also estimates the decline in employment caused due to decline in exports during the period of global economic crisis, i.e. 2007-08 to 2009-10 and estimates the extent to which the employment will be generated if a recovery of exports takes place according to predictions related to revival of the world economy.

✦ The unorganized sector in India employs more than 80% of total Indian labour. The study estimates the impact of trade on employment and wage rates paid by enterprises of different sizes operating in the unorganized sector. The location of an enterprise, in terms of the state to which it belongs, has an important bearing on the impact of trade. Irrespective of the export orientation of the industry, unorganized enterprises in states with higher export orientation may gain more from exports. The study computes the export orientation of 15 major states of India, and estimates the significance of the location of the enterprise on the impact that trade has on employment and wages.

✦ Higher returns to unskilled labour can be an important tool for alleviating poverty. The study estimates the impact of trade on the wages and employment of unskilled labour in the agriculture sector, which has the highest number of poor people, and in the organized and unorganized manufacturing sectors.

Productivity

✦ An important aspect of trade liberalization is to induce competition and increase productivity levels. Studies have found that as firms are exposed to international competition (through exports) and domestic competition (through imports), labour productivity rises. Most of the studies examine the productivity-enhancing effects of trade in India for the organized manufacturing sector. This study estimates the impact of trade on the productivity of unskilled workers in both the organized and the unorganized manufacturing sector.

✦ Furthermore, differential impact of trade on the labour productivity of skilled and unskilled labour is carried out in the organized manufacturing sector.

Equity

✦ Whether trade-induced growth is accompanied by higher/lower inequality is an important issue. Most of the earlier studies for India have examined this issue by comparing indicators of inequality, e.g. Gini coefficients in the pre- and post-liberalization period. However, this approach is unable to establish whether trade is a cause for rising/falling inequality. The approach used in this study is to compare gains from trade across different income groups and segmented labour markets. To assess the gains from exports that percolate down to the poor, the study estimates the extent to which exports in the period 2003-04 to 2006-07 generated incomes across five income groups, which include people in abject poverty and those below the poverty line.

✦ The study also estimates the extent to which trade has led to an increase in the gap between wages earned by skilled and unskilled labour. The higher the gap, the higher the rise in inequality in the economy will be.

✦ It has been often argued that gains from trade are not gender-neutral and that women tend to gain less than men do. An in-depth analysis has been undertaken to estimate the impact of trade in gender employment. To gender-sensitize trade policy in India and harness further gains from trade for women, the study has identified ***gender-sensitive products*** for India, which can be used in trade negotiations.

Sustainability

✦ Sustainability of gains from trade is an issue of concern. To improve and sustain the gains to the poor from trade, it is important to arrive at specific policy actions. The study derives policy directions from the analysis and suggests specific policy actions to increase the gains from trade to the poor.

1.2 Issues examined in the study

To examine how the poor are affected by international trade in India, the study specifically examines the following issues:

(a) To what extent have exports generated direct and indirect employment in India? What was the impact of the global slowdown on employment in the year 2008-09?
(b) To what extent are the gains from trade reaching the poor?
(c) How are the wages and employment of workers in the unorganized sector affected by exports and import competition in the industries?
(d) How are the wages and employment of unskilled labour in the agriculture sector affected by international trade?
(e) How are the wages and employment of unskilled labour affected by trade in the organized manufacturing sector?
(f) Does higher trade lead to higher labour productivity, thereby leading to higher returns for unskilled labour?
(g) Is trade associated with greater inequality in wages between skilled and unskilled labour?
(h) To what extent are trade impacts on employment gender-neutral?
(i) Policy directions for improving and sustaining the gains from trade for the poor.

This study is a pioneering study in four major respects. ***Firstly***, earlier studies on the impact of trade on employment and wages have been at a disadvantage in terms of lack of trade data at the industry level. Attempts were made to construct industry-level export data by aggregating firm-level exports. However, many firms may not be listed firms, in which case the firm-level export aggregation may have a downward bias. In the case of quantifying the import competition faced by an industry, lowering of tariffs has been used by most of the studies in order to indicate higher imports. However, lowering of tariffs does not necessarily translate into higher imports, especially when domestic supply is sufficient. To address these concerns, the study constructs a concordance matrix between six-digit product-level data (2002 Harmonized System of Coding) and three-digit industry-level data (National Industrial Classification). Using this concordance matrix, the exports and imports of products have been matched to the respective industries in order to arrive at industry-level trade data. The industry-level trade data are then used to estimate the impact of exports and imports on different characteristics of the labour market.

Secondly, the study looks at the impact of export intensity of industries, and import competition faced by the industries in the organized sector, on employment, wage rates and the labour productivity of enterprises in the unorganized sector. This traces an important channel through which the effects of trade can percolate to the poor. Furthermore, the study estimates the impact that trade can have on the employment and wage rate of enterprise in the unorganized sector in different locations.

Thirdly, the study uses similar methodology to estimate the impact of trade in different sectors of the economy in the same period. The data at the enterprise level are taken from National Sample Survey (NSS) 62nd Round. The estimations for the unorganized manufacturing sector are carried out for around 81,000 enterprises for the year 2005-06. The trade data at the three-digit industry level are matched to the

enterprise-level data using the industrial classification specified for each enterprise in the NSS dataset. The estimations for the organized manufacturing sector are undertaken using a panel data for 78 industries for the period 1998-99 to 2004-05. The industry-level data are extracted from the Annual Survey of Industries (ASI), to which the trade data are matched using the concordance matrix. Similar labour demand and wage equations across sectors have been estimated. This makes comparison of the trade-related effects across sectors possible, which may be extremely useful for trade policy formulation, as it is imperative to understand the implications of trade policies across sectors.

Finally, the study estimates the extent to which exports in the period 2003-04 to 2006-07 generated employment in 46 sectors of the economy as well as incomes for people below the poverty line and those in abject poverty. It also estimates the employment loss due to the global slowdown in 10 disaggregated export sectors. Furthermore, the impact of exports and imports on gender employment in the organized manufacturing sector has been estimated. The study also makes a pioneering attempt to identify ***gender-sensitive products,*** which may form a practical basis for gender sensitization of trade policy.

The chapter scheme of the study is as follows: Chapter 2 records the trends in trade, growth, and poverty indicators in India. Chapter 3 briefly reviews the literature on trade and poverty. Chapter 4 estimates the economy-wide impact of exports on employment. Using input-output tables, it estimates both direct and indirect employment created by exports of India in the period 2003-04 to 2006-07. It also estimates the economy-wide employment losses due to global slowdown in the year 2008-09. To assess the extent to which the gains from trade percolate down to the poor, estimates are undertaken of the distribution of income generated by exports across five income groups, which include the poor and those in abject poverty.

Chapter 5 estimates the impact of trade on labour markets in the unorganized sector. The impact of export intensity and import competition faced by the industry to which the enterprise belongs, on wages and employment, has been estimated. Further, an attempt has been made to estimate the impact of the trade orientation of states on labour markets in the unorganized sector. Chapter 6 quantifies the effects of trade on the wages of unskilled labour in agriculture. The impact is estimated at the aggregate level, and also for selected agricultural products. Chapter 7 estimates the extent to which trade has affected the wages of unskilled labour in the organized manufacturing sector. It also assesses the extent to which trade has affected inequality in the wages of skilled and unskilled labour, and has differentially affected their labour productivities. Chapter 8 undertakes a detailed analysis of the gender effects of trade, by identifying gender-sensitive products and by estimating the impact of exports and imports on gender employment in the organized manufacturing sector. Chapter 9 summarizes and provides policy directions for improving and sustaining gains from trade for the poor.

CHAPTER II: TRENDS IN INDIA'S TRADE, GROWTH AND POVERTY INDICATORS

2.1 Introduction

After independence, India adopted a mixed economy strategy, with self-reliance as the principal objective. Import substitution and export pessimism was the underlying trade strategy. However, doubts about the effectiveness of this policy regime arose as early as the mid-1970s. Since then, a series of reforms have been undertaken towards opening up the economy, although effective reforms only started taking place in the early 1990s. Since the 1990s, India has made substantial progress in terms of its openness through trade. These reforms have furthered the globalization process with respect to the cross-border movement of capital, goods and services. This chapter highlights the trends in India's merchandise and services trade. Subsequently, it also presents trends in India's growth and poverty indicators.

2.2 Trends in the volume of trade: Changing significance

The importance of trade for India has changed significantly over the years. India's trade as a percentage of GDP has risen steadily since 1990. It increased from 16% in 1990 to 46% in 2007, and in 2008, more than half of India's GDP was traded. Merchandise trade has always been higher in India than trade in services. In 2008, services trade constituted 14% of GDP, while merchandise trade amounted to 41% of GDP.

Table 2. 1 India's trade as percentage of GDP: 1990-2008

Year	Trade as % of GDP	Services Trade as % of GDP	Merchandise Trade as % of GDP
1990	16	3	13
1991	17	4	14
1992	19	5	18
1993	20	4	16
1994	20	4	16
1995	23	5	18
1996	22	5	18
1997	23	5	19
1998	24	6	18
1999	25	7	18
2000	27	7	20
2001	26	7	20

2002	30	7	21
2003	31	7	22
2004	38	9	25
2005	43	11	30
2006	47	12	32
2007	46	11	31
2008	51	14	41

Source: World Development Indicators (2010).

2.2.1 India's merchandise trade

India's trade, both in terms of exports and imports, has grown at an unprecedented rate since 2000. Global merchandise exports increased from $44.5 billion in 2000-01 to $185.2 billion in 2008-09. Merchandise imports, on the other hand, have grown much faster; they increased from $50.5 billion in 2000-01 to $303.6 billion in 2008-09. A large part of the growth in imports has been due to both volume growth and to rises in the import price of crude oil.

India's trade sector was not able to remain insulated from the global economic crisis, which began in 2007. A close look at India's trade sector indicates that growth in India's exports and imports in both goods and services declined in real terms. However, the impact of the slowdown came with a lag. Growth in exports of goods declined from 28.9 % in 2007-08 to 3.4% in 2008-09. In 2009-10, both annual export and import growth rates became negative, with export growth at -4.7% and import growth at -8.2%.

2.2.2 India's services trade

In less than two decades, India has become one of the top five exporters of services amongst developing countries. It has surpassed some of the other Asian countries that dominated the services trade in the 1990s. India has been deemed a major exporter of services in the world, with a market share of 2.6 % in 2007 as against 0.6 % in 1995. India's services sector has matured considerably during the last few years, and has been globally recognized for its high growth and development. Indian services exports grew at a compounded annual growth rate (CAGR) of 17% during 1993-2000, but grew at a much faster pace during 2001-2008, recording a CAGR of about 24%. There has been a rapid growth in services exports since 2002. Exports have grown from $20.8 billion in 2002 to $90.1 billion in 2007-08 and then to $101 billion in 2008-09. The global slowdown since 2007 had a relatively moderate impact on export growth of services from India, remaining positive at 16% in 2008-09.

2.3 Composition of India's trade basket

2.3.1 Composition of merchandise trade

In the post-liberalization period, the composition of India's exports has experienced a substantial change. The share of agriculture and allied activities in India's exports fluctuated in the period 1994-95 to 2004-05. It was 16% in 1994-95, increased to 19% in 1995-96, and peaked in 1996-97 at 20.5 %. Subsequently it fell to 18.8 % in 1997-98. The downward trend continued in 1999-2000, and the share reduced to 14% in 2000-01. The share of agriculture and allied activities in India's exports in 2006-07 was 10.3%, while the share of primary products in its exports was 15.1% (table 2.2).

Table 2.2 Commodity composition of exports

Commodity group	Share (per cent)					CAGR	Growth rate (per cent)[a]			
				April-Sep.		2000-01 to			April-Sep.	
	2000-01	2005-06	2006-07	2006-07	2007-08	2004-05	2005-06	2006-07	2006-07	2007-08
I. Primary products	16.0	15.4	15.1	13.5	13.4	16.9	18.9	19.8	18.5	16.7
Agriculture & allied	14.0	10.2	10.3	9.5	9.3	9.0	19.8	23.5	24.7	15.1
Ores & minerals	2.0	5.2	4.8	4.0	4.1	49.9	17.4	12.6	6.0	20.6
II. Manufactured goods	78.8	72.0	68.6	68.4	67.4	15.3	19.6	16.9	18.1	15.9
Textile incl. RMG	23.6	14.5	12.5	12.9	11.1	4.3	20.4	5.7	33.5	1.2
Gems & jewellery	16.6	15.1	12.6	12.7	13.0	16.8	12.8	2.9	-0.6	20.4
Engineering goods	15.7	20.7	23.3	22.8	23.5	25.4	23.4	38.1	48.1	21.2
Chemical & related products	10.4	11.6	11.2	11.1	10.4	21.7	17.3	19.1	28.4	10.2
Leather & leather manufactures	4.4	2.6	2.4	2.4	2.3	5.5	11.1	12.1	7.7	12.7
Handicrafts (Incl. carpet handmade)	2.8	1.2	1.1	1.1	0.8	-5.3	30.3	4.1	5.2	-14.5
III. Petroleum, crude & products (including coal)	4.3	11.5	15.0	16.5	17.9	38.7	66.2	59.3	106.2	27.6
Total exports	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**17.0**	**23.4**	**22.6**	**27.3**	**17.6**

Source: Economic Survey 2007-08.

The share of manufacturing products in exports has also declined over time. In 2000-01 it accounted for 78.8% of total exports, while in 2006-07 the share declined to 68.6%. Within manufacturing, the share of traditional exports such as textiles and clothing, gems and jewellery, leather and handicrafts has declined, while the share of engineering goods and chemical products has risen. This marks a shift in India's export pattern. Interestingly, the share of petroleum, crude and products (including coal) has risen significantly from 4.3% in 2000-01 to 15% in 2006-07.

A further sector-wise comparison (table 2.3), shows that the share of petroleum products (including rubber and plastic products) in India's export basket has been increasing since 2004. India exported $6.8 billion worth petroleum products in 2004, which increased to $23.6 billion in 2007 and further to $30.4 billion in 2008, and its share increased from 8.6% to 18.1%. Interestingly, the share of textiles, which was a predominant sector in the export basket in 2004 (16.8%), has been declining continuously, and reached 12% in 2008. Engineering goods, representing a very broad category, continues to be the sector with the highest share in India's export basket. Its share further increased from 19.7% in 2004 to 25% in 2008. The share of chemical and chemical products has remained the same over time (13.7%), while the share of gems and jewellery has declined from 18% in 2004 to around 11% in 2008.

Interestingly, exports of India's agricultural products have been rising steadily, from $6.0 billion in 2004 to $14.9 billion, though their share in India's export basket still remains low (around 9%). Although exports of ores and minerals have nearly doubled, from $4.3 billion to $8.4 billion in 2008, this sector's share in the export basket remains at around 5%. Marine products and plantations have a share of around 1%, which has not changed over time.

Table 2. 3: Change in the composition of India's export basket (%): 2004-2008

S.No		**2004**	**2006**	**2008**
1	ENGINEERING GOODS	19.70	21.79	24.87
2	PETROLEUM PRODUCTS	8.63	14.96	18.15
3	CHEMICALS AND RELATED PRODUCTS	13.72	13.67	13.65
4	TEXTILES	16.77	15.40	12.20
5	GEMS AND JEWELLERY	17.84	12.72	11.23
6	AGRICULTURAL AND ALLIED PRODUCTS	7.63	6.78	8.94
7	ORES AND MINERALS	5.42	4.78	5.05
8	LEATHER AND MNFRS	3.20	2.66	2.05
9	MARINE PRODUCTS	1.71	1.40	0.87
10	PLANTATION	0.99	0.94	0.63
	Total	100.00	100.00	100.00

Source: Directorate-General of Commercial Intelligence and Statistics.

The above trends in the composition of India's export basket show that India's export basket has diversified in the past five years, with engineering goods, petroleum products and chemical products increasing their share in the export basket, while the share of traditional exports such as textiles, gems, and jewellery and leather has gone down.

Unlike its export pattern, India's import pattern has not shown too much of a change over the past six years. POL continues to have a share of around 30-32%, while capital goods imports have increased from 10.5 to 13% (table 2.4).

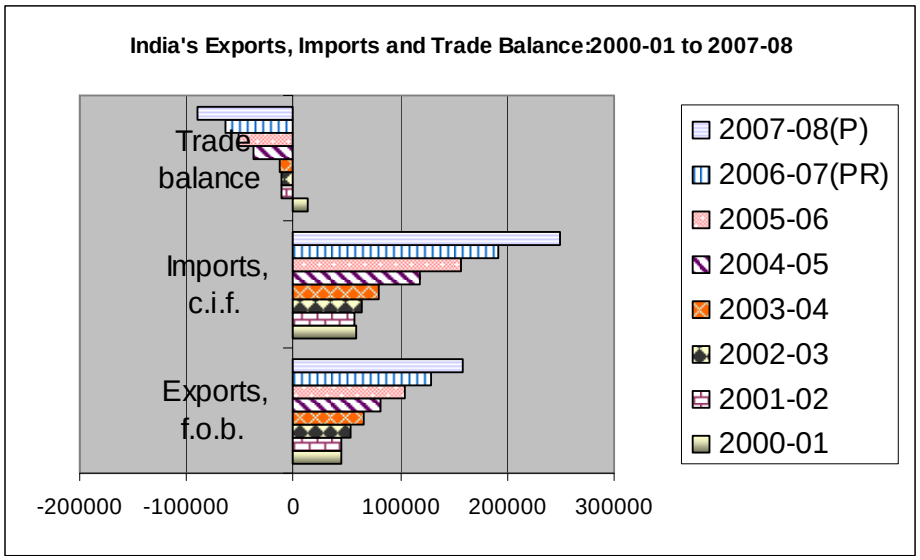
Table 2. 4: Commodity composition of imports

Commodity Group	Share (per cent)					CAGR 2000-01 to 2004-05	Growth rate (per cent)*			
				April-September					April-September	
	2000-01	2005-06	2006-07	2006-07	2007-08		2005-06	2006-07	2006-07	2007-08
Food & allied products	3.3	2.5	2.9	2.3	2.2	24.3	-4.7	42.4	-5.8	26.6
1. Cereals	0.0	0.0	0.7	0.1	0.1	16.1	36.8	3589.6	803.8	-55.5
2. Pulses	0.2	0.4	0.5	0.3	0.5	38.0	41.3	53.8	9.6	92.8
3. Edible oils	2.6	1.4	1.1	1.2	1.2	17.2	-17.9	4.2	-11.8	32.9
Fuel (of which)	33.5	32.1	33.2	36.3	33.6	18.5	44.8	29.0	39.8	18.0
4. POL	31.3	29.5	30.8	33.8	31.0	17.5	47.3	30.0	41.2	16.9
Fertilizers	1.3	1.3	1.6	1.7	1.9	17.2	59.4	52.4	54.4	48.2
Capital goods (of which)	10.5	15.8	15.4	13.1	13.2	28.9	62.5	21.8	44.3	28.3
5. Machinery except electrical & machine tool	5.9	7.4	7.5	8.1	8.2	26.2	49.0	24.9	39.5	28.3
6. Electrical machinery	1.0	1.0	1.1	1.1	1.1	25.6	25.9	30.3	37.9	28.6
7. Transport equipment	1.4	5.9	5.1	2.1	2.5	57.7	104.2	6.8	55.7	51.2
Others (of which)	46.3	43.7	43.8	37.8	40.4	23.5	21.1	24.6	-2.8	36.4
8. Chemicals	5.9	5.7	5.2	5.6	5.2	23.6	23.2	14.1	13.2	19.8
9. Pearls, precious & semi precious stones	9.6	6.1	4.0	4.1	4.2	18.3	-3.1	-18.0	-32.8	30.6
10. Gold & silver	9.3	7.6	7.9	7.7	10.3	24.5	1.5	29.4	-3.1	71.0
11. Electronic goods	7.0	8.9	8.6	9.0	8.9	29.9	32.5	20.6	34.0	26.2
Grand total	100.0	100.0	100.0	100.0	100.0	22.2	33.8	24.5	23.5	27.7

* Growth rate in dollar terms.
Source: Economic Survey 2007-08.

From 2001-02 onwards, India's merchandise imports have always been higher than its merchandise exports, leading to a negative trade balance, which has grown over the years (fig. 2.1). Furthermore, imports are growing at a much higher rate than exports. In 2008, India's exports grew by 23.7%, while its imports grew by 38%.

Figure 2. 1 India's exports, imports and trade balance: 2000-01 to 2007-08



In terms of services, however, export growth is much stronger than import growth, which has led to an ever-growing positive trade balance in India's services trade. This reflects the importance of the services sector in India's total trade.

Within merchandise imports, India's oil imports are much higher than its non-oil imports.

- **Oil imports**

Since October 2007, there has been a steady rise in the value of imported oil. This can be attributed to increases in oil prices. After July 2008, there was a drastic decline in India's oil imports on account of a fall in prices. The volume of oil imports grew by almost 212 % in 2008-09, over 2004-05 (Table 2.5). The rate of growth of oil imports in each financial year, over the previous financial year, remained greater than 30% except in 2008-09 (17%).

Table 2. 5: India's oil imports and rates of growth (%).

FY	Oil imports (in millions of dollars)	ROG (%)
2004-05	29,844	
2005-06	43,963	47.31
2006-07	57,099	29.88
2007-08	79,715	39.60
2008-09	93,176	16.88

- **Non-oil imports**

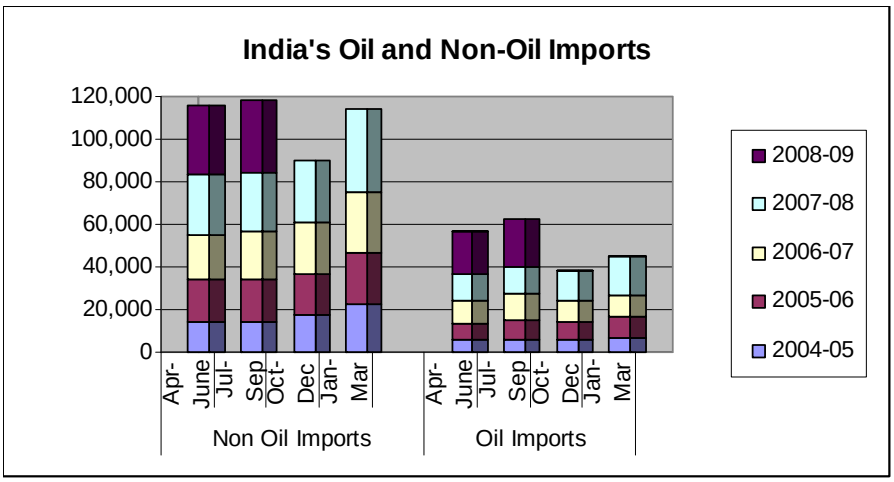
India's non-oil imports have increased steadily over time (table 2.6). Non-oil imports grew at almost 138 % in 2008-09 over 2004-05. However, the growth rate fell from 33.8% in 2007-08 to 13.16% in 2008-09.

Table 2. 6: India's non-oil imports and rates of growth (%).

FY	Non-oil imports ($ millions)	ROG (%)
2004-05	81,673	
2005-06	105,203	28.81
2006-07	128,505	22.15
2007-08	171,940	33.8
2008-09	194,584	13.16

Within the import basket, the decomposition of imports between oil and non-oil imports does not seem to have changed much over time for India (fig. 2.2).

Figure 2. 2 Composition of India's import basket: 2004-05 to 2008-09



2.3.2 Composition of India's services trade

India's export basket of services has not diversified over time, as around 40% of India's exports have been comprised of software services since 2000-01. Export of software services has grown at a compound rate of growth of 26%, as compared to 24% of total services (table 2.7). Apart from software services, the travel and transportation services constitute the export basket, with a share of around 12% and 11% respectively in 2007-08.

Table 2. 7: Composition of India's exports of services

Invisibles by Service Export of Transactions										
	CAGR 1993-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	CAGR 2000-2008
Travel	4.56%	3,497	3,137	3,312	5,037	6,666	7,853	9,123	11,349	15.85%
YoY Growth		*15.18%*	*-10.29%*	*5.58%*	*52.08%*	*32.34%*	*17.81%*	*16.17%*	*24.40%*	
Transportation	2.53%	2,046	2,161	2,536	3,207	4,683	6,325	7,974	10,014	21.96%
YoY Growth		*19.86%*	*5.62%*	*17.35%*	*26.46%*	*46.02%*	*35.06%*	*26.07%*	*25.58%*	
Insurance	9.29%	270	288	369	419	870	1,062	1,195	1,639	25.29%
YoY Growth		*16.88%*	*6.67%*	*28.13%*	*13.55%*	*107.64%*	*22.07%*	*12.52%*	*37.15%*	
G.N.I.E	52.75%	651	518	293	240	401	314	253	330	-8.14%
YoY Growth		*11.86%*	*-20.43%*	*-43.44%*	*-18.09%*	*67.08%*	*-21.70%*	*-19.43%*	*30.43%*	
Miscellaneous of which:	31.99%	9,804	11,036	14,253	17,965	30,629	42,105	55,235	66,745	27.09%
YoY Growth		*-3.44%*	*12.57%*	*29.15%*	*26.04%*	*70.49%*	*37.47%*	*31.18%*	*20.84%*	
Software		6341	7556	9600	12800	17700	23600	31300	40,300	26.01%
YoY Growth			*19.16%*	*27.05%*	*33.33%*	*38.28%*	*33.33%*	*32.63%*	*28.75%*	
Total	16.91%	16,268	17,140	20,763	26,868	43,249	57,659	73,780	90,077	23.85%
YoY Growth		*3.56%*	*5.36%*	*21.14%*	*29.40%*	*60.97%*	*33.32%*	*27.96%*	*22.09%*	

G.N.I.E: Government services not included elsewhere.* ***Figures in millions of United States dollars.*
Source: www.rbi.org.in

2.4 Direction of India's exports

2.4.1 Direction of India's merchandise exports

In the 1990s, more than half of India's exports were directed towards OECD markets, with 28% directed to EU markets and around 15% to the United States. Around 16% went to the Russian Federation and a similar percentage to developing countries, with Asian markets being more dominant (table 2.8). However, over time, there has been some diversification in terms of the direction of India's exports. The European Union's share declined from 28% in 1995-96 to 20% in 2007-08, while the United States' share declined from 17.4% in 1995-96 to 13% in 2007-08. The United Arab Emirates' share increased from 4.5% in 1995-96 to 9.7% in 2007-08. There has been considerable increase in the share of Asian developing countries in India's export basket, from 23% in 1995-06 to 31.5% in 2007-08. Africa's share has also increased over time. It is interesting to note that share of developing countries in India's exports increased from 17% in 1990-91 to 42% in 2007-08.

The fact that India was able to diversify its exports to different countries has helped in softening the impact of global slowdown on its exports. However, the bulk of India's exports, i.e., 33% is still directed towards the European Union and the United States.

Table 2. 8: Share of region/country in India's exports: 1990-91 to 2007-08

Group / Country				1990-91	1995-96	2000-01	2005-06	2007-08
I.	**OECD**			**56.5**	**55.7**	**52.7**	**44.5**	**38.8**
	A.	**EU**		**27.5**	**27.4**	**23.4**	**21.7**	**20.2**
	B.	North America					17.8	13.8
		1	Canada	0.9	1.0	1.5	1.0	0.8
		2	**United States**	**14.7**	**17.4**	**20.9**	**16.8**	**13.0**
	C.	Asia and Oceania				5.1	3.3	3.1
		of which:						
		1	Australia	1.0	1.2	0.9	0.8	0.7
		2	Japan	9.3	7.0	4.0	2.4	2.2
	D.	Other OECD countries				1.9	1.6	1.7
II.	**OPEC**			**5.6**	**9.7**	**10.9**	**14.8**	**16.5**
	of which:							
	1	**United Arab Emirates**		**2.4**	**4.5**	**5.8**	**8.3**	**9.7**
III.	**Eastern**			**17.9**	**4.2**	**3.0**	**1.9**	**2.1**

	Europe							
	of which:							
	1.	**Russian Federation**		**16.1**	**3.3**	**2.0**	**0.7**	**0.6**
						0.0	0.0	0.0
IV.	**Developing countries**			**17.1**	**28.9**	**29.2**	**38.5**	**42.3**
	of which:							
	A.	Asia		14.4	23.0	22.5	30.1	31.5
		a)	SAARC	2.9	5.4	4.3	5.4	5.7
		b)	**Other Asian**		**17.6**	**18.2**	**24.7**	**25.8**
	B.	Africa		2.2	4.8	4.4	5.5	7.6
	C.	Latin American countries		0.5	1.2	2.3	3.0	3.2
V.	**Others / unspecified**			2.9	1.5	4.3	0.3	0.4
	Total Trade			100.0	100.0	100.0	100.0	100.0

Source: Estimated from RBI *Handbook of Statistics on Indian Economy*. Directorate-General of Commercial Intelligence and Statistics.

2.4.2 Direction of India's exports of services

Exports of services from India have been oriented mostly towards the EU25 and the United States in the developed world. The United States and the United Kingdom are the two most important destinations for services exports. According to the Economic Survey 2007-08, India exports travel services mainly to the EU, and transportation services to South-East Asia.

Around 13% of total Indian services exports were oriented towards the EU25 in 2003. However, the share came down to 10% in 2005. The United States accounted for about 8.7% of total India's services exports in 2005. Interestingly, the share of the United States went up to around 10.7% in 2007 (table 2.9).

Table 2. 9: Services exports of the United States, and share in global Indian services exports

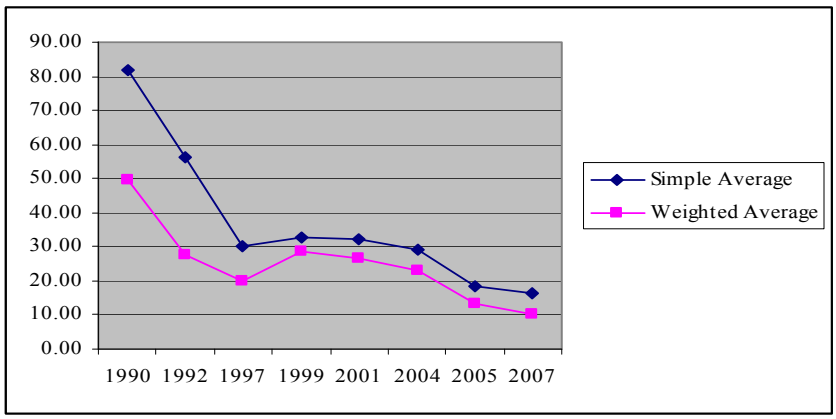
Year	Exports to United States (in millions of dollars)	Share of United States in total exports (%)
2003	2000	7.4
2004	2886	6.7
2005	5057	8.8
2006	7693	10.4
2007	9664	10.7
2008	12141	-

Source: Bureau of Economic Analysis.

2.5 Trends in tariffs

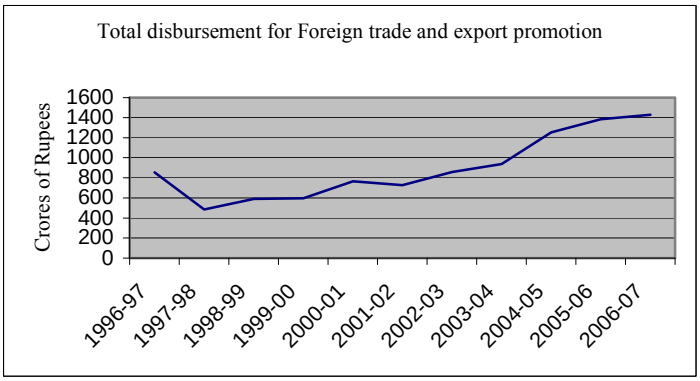
India's tariff levels have experienced a significant decline ever since India embraced liberalization in 1991 (fig. 2.3). Considering Simple Average Tariffs, the tariff level dropped from 81.8% in 1990 to 56.3% in 1992. In 1997, the tariff level dropped even more sharply to 30.09%, but then increased in 1999 to 32.9%. Since 1999, there has been a steady decline in simple average tariffs, reaching 16.4% in 2007. As far as Weighted Average Tariffs are concerned, this tariff level was down to 27.8% in 1992 from 49.5% in 1990. In 1997, the level was 20.1%, which increased to 32.9% in 1999. In 2001, Weighted Average Tariffs declined to 26.5%, and continued their downward trend, reaching 10.4% in 2007.

Figure 2. 3 India's tariffs 1990-2007



Over the years, the Government has taken specific policy measures with a view to promoting exports. This is evident in the increasing expenditure on export promotion. Figure 2.4 maps the trend in total disbursement (nominal) from the Indian Government's budget for foreign trade and export promotion.

Figure 2. 4: Total disbursement for foreign trade and export promotion



2.6 Trends in the Trade to GDP Ratio and the Trade Restrictiveness Index

The volume of trade as a proportion of GDP has increased over time in India. This has more than doubled in 2005-06 compared to 1990-91. The growth is faster if trade in services is included (table 2.10).

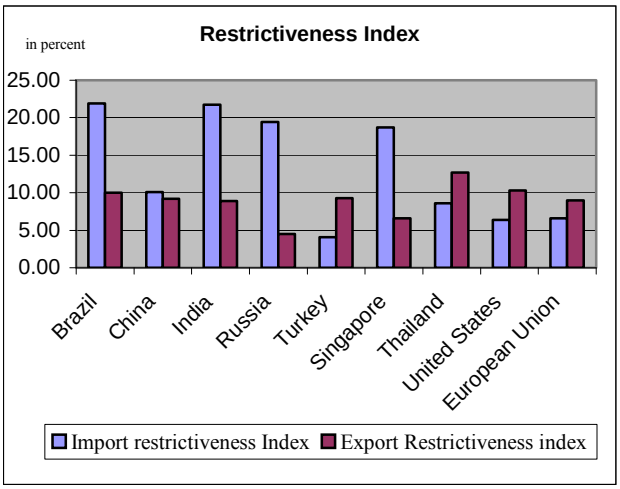
Table 2. 10: Trade as a proportion of GDP

Year	Trade in goods and services as a percentage of GDP
1990-91	17.2
1995-96	25.7
2000-01	29.2
2005-06	44.8
2006-07	47
2007-08	46
2008-09	51

Source: RBI and WDI.

However, in spite of these trends in trade and openness, India is found to have a high import restrictiveness index. India's import restrictiveness index was at 21.7%, which is much higher than some of the selected countries (fig. 2.5), whereas the export restrictiveness index was at 8.9%, which is lower than some of these countries.

Figure 2. 5: Trade restrictiveness indices



Source: Global Monitoring Report.

The number of trade agreements signed or negotiated is useful in assessing the progress of India in achieving higher openness. By March 2007, there were 197 trade agreements as compared with only 24 agreements in 1986, and 66 agreements in 1996.

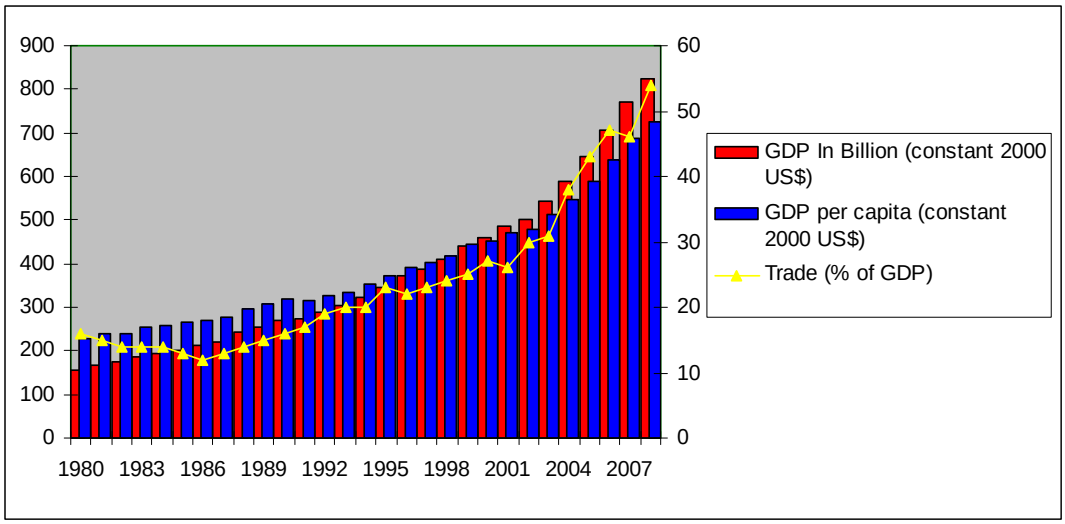
2.7 Trends in growth and poverty

India produces nearly 6.4% of world output and is home to nearly 16.9% of the world's total population *(World Development Indicators, 2006)*. Importantly, India's share of population living in extreme poverty (i.e. on an income of less than $1 a day) is 34.3% (1990-2005, HDR 2007-08). These numbers more than double if a broader definition of poverty is used: i.e. the number of people living on less than $2 a day is 80.4% (1990-2005, HDR 2007-08). While there has been a rapid rise in GDP growth, this has not been accompanied by a corresponding growth in employment.

2.7.1 Trends in growth

There has been steady growth in GDP and per capita GDP in India since 1980, and this has improved considerably since the 1990s (fig. 2.6).

Figure 2. 6: GDP, Per capita GDP and Trade to GDP Ratio.



Source: World Development Indicators (2009).

The average annual growth rate of GDP in the 1980-1989 period was 5.7%, and it continued to remain at 5.7% in the 1990-1999 period, while the average annual growth rate of per capita GDP increased from 3.5% to 3.8% in this period (table 2.11). Correspondingly, the trade to GDP ratio rose from 14% average annual growth in the 1980-89 period to 20.9% in the 1990-99 period. In the 2000-2008 period, the

average annual growth rate of GDP increased from 5.7 % to 7.1%, while that of per capita GDP increased from 3.8% to 5.7% – indicating a slower rise in per capita GDP. However, the trade to GDP ratio increased by a stupendous average annual growth rate of 38%, suggesting the growing importance of trade in the Indian economy.

Table 2. 11: Average annual growth of GDP and per capita GDP; and the Trade to GDP Ratio

	Average annual growth of GDP	Average annual growth of per capita GDP	Average annual growth rate of the Trade to GDP Ratio
1980-1989	5.7	3.5	14
1990-1999	5.7	3.8	20.9
2000-2008	7.1	5.7	38

Source: World Development Indicators (2009).

2.7.2. Trends in poverty

In India, estimates of the incidence of poverty by the Planning Commission on the basis of the head-count ratio given by various rounds of the NSS show that poverty has been consistently declining for the country as a whole. The percentage of people below the poverty line declined from 54.8 % in 1973-74 to 38.3 % in 1987-88. In the post-liberalization period, this fell further to 35.9 % in 1993-94, and then to 26.1 % in 1999-2000. These figures, however, are not comparable, as they have been calculated for different recall periods: the uniform recall period (URP) for 1993-94, and the mixed recall period (MRP) for 1999-00. In 2004-05, the estimated poverty ratio by the URP method was 27.5 (making it comparable with the 1993-94 ratios), whereas by the MRP method it was 21.8 (making it comparable with the 1999-2000 ratio).

The uniform recall period (URP) consumption data of the NSS' 61st Round yields a poverty ratio of 28.3% in rural areas, 25.7% in urban areas, and 27.5% for the country as a whole in 2004-05. The corresponding All India figures are 36% for 1993-94, and 27.5% in 2004-05 (table 2.12).

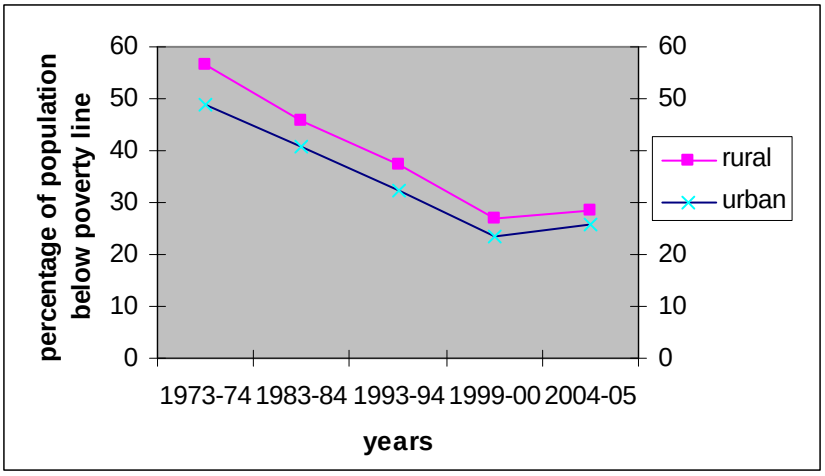
Table 2. 12: Poverty ratios by URP (per cent)

S.No	**Category**	**1993-94**	**2004-05**
By uniform recall period (URP) method			
1	**Rural**	**37.3**	**28.3**
2	**Urban**	**32.4**	**25.7**
3	**All India**	**36.0**	**27.5**

Source: Economic Survey 2007-08.

Nevertheless, the percentage of the population living below the poverty line in India has been steadily falling. Figure 2.7 shows a slight increase in poverty over the last 6 years, but that could be due to differences in the method of poverty calculation.

Figure 2. 7:Percentage of the population below the poverty line



Source: Reserve Bank of India.

2.7.3. Trends in inequality

A more equitable distribution of resources ensures higher human development in a country. A skewed distribution, on the other hand, means that a significant proportion of the population is getting a disproportionately lower share of the total pie. The conventional measure of inequality in income is the Gini coefficient, which ranges from zero (absolute equality) to 1 (one person receives all the income). Growth is inevitably followed by some increase in inequality, but the worst scenario arises when slow growth is accompanied by increasing inequality.

The trends in the Gini coefficient for India are similar to those seen for most developing countries – i.e. growth accompanied by rising inequality (table 2.13).

Table 2. 13: Trends in the Gini coefficient

	1980s average	**Early 1990s**	**Late 1990s**	**2004-05**
India	0.293 (c)	0.315 (c)	0.378 (c)	0.368

Note: (c): Trends in consumption data.

The rural and urban Gini coefficients calculated for India give us an indication of the level of inequality in these areas. The rural Gini for India was 30.10 in 1983. It increased marginally in 1986-87 and 1987-88, and then dropped to a low of 27.71 in 1990-91. In the subsequent period, it continued to increase and was back to the 1983

level in 1997 (in fact marginally higher, at 30.11). The urban Gini, on the other hand, was 33.40 in 1983; it increased to 33.95 in 1990-91 and then to 36.12 in 1997. Inequality, therefore, has been on the rise in both the rural and urban sectors in India. However, trends reveal that inequality is worsening more rapidly in rural areas than in urban areas. However, the urban–rural spending gap, which widened in the 1990s, has started to close in the past five years.

2.8 Summary and conclusion

Amidst the existing debates on the trade–poverty relationship, the chapter records the trends in India's trade, poverty, growth and inequality over the period 1980 to 2008. It is found that in the post-1990s India has increasingly integrated with the world economy through trade. Not only have average tariffs declined significantly, from 80% in 1990-91 to around 18% in 2007-08, but the trade to GDP ratio has increased too, from 16% in 1990-91 to 51% in 2008. Correspondingly, the percentage of people below the poverty line declined from 36% in 1993-94 to 27.5% in 2004-05. However, India's Gini coefficient, which indicates the extent of inequality, shows a steady rise from 0.31 in the early 1990s to 0.36 in 2004-05. There has also been a rise in unemployment over time.

Although trade policies are rarely formulated with the objective of reducing poverty, trade may affect the lives of the poor in a substantive way. In view of this, it may be imperative for trade policymakers to use trade policy as an instrument for generating employment and incomes for the poor. However, for this to happen, it is important to identify the channels through which the poor may be affected by trade. Though considerable literature exists on the trade–poverty nexus, there are only very limited studies in existence to quantify the extent to which the poor are affected by trade.

CHAPTER III: THE TRADE–GROWTH–POVERTY NEXUS: THEORETICAL FRAMEWORK AND REVIEW OF LITERATURE

3.1 The trade–growth–poverty nexus: Theoretical framework

The existing literature on trade and poverty has been categorized into the two broad strands – one which explains the *static* relationship between trade and poverty with resources and technology as given, and the other which explains the *dynamic* relationship between trade and poverty via growth. The static literature concentrates on two main channels through which trade can directly affect poverty, irrespective of growth. These are through the employment effect and through stable macroeconomic policies, which indirectly influence the poor. The dynamic strand of literature, on the other hand, breaks down the relationship between trade and poverty into the trade–growth and the growth–poverty relationship.

3.1.1 Trade–poverty relationship: Static framework

There are two main theoretical approaches or analytical frameworks for understanding the channels through which international trade might impact on the labour market and thereby affect poverty. The first is the neoclassical Hecksher-Oklin (H-O) model, which provides predictions about the impact of trade between countries with different resource endowments – as in the case of trade between developed and developing countries. The second approach is subsumed into what is called the "new trade theories", which describe trade between countries with similar resource endowments – as in the case of trade between developed countries or between developing countries.

The H-O model predicts that comparative advantage arises from the differences in relative endowments of factors of production. Nations will therefore specialize in producing goods that employ more of their relatively abundant factor. For instance, developed countries that have relatively more abundant capital would export capital-intensive goods and services, and would import labour-intensive goods and services from developing countries where labour is relatively more abundant. Such predictions are reflected by the actual pattern of trade between developed and developing countries (OECD, 1994). Thus, under the assumption of the two factors and two goods version of the model, the movement from autarky to trade is associated, in both countries, with an increase in the relative price of the good that uses the relatively abundant factor more intensively. Assuming each country produces both the goods, the relative price of the two goods will increase in the labour-abundant country, making the production of labour-intensive goods more profitable. The opposite will happen in the capital-abundant country.

Such a change will lead to an increase in demand for labour in the labour-abundant country. Under the model's assumption of full employment, this will entail an

increase in wages. If this assumption is relaxed, then the increase in the demand for labour may translate into higher employment as well as an increase in wages. The precise magnitude would depend upon the labour-market conditions. Trade will therefore benefit labour in developing countries, thereby increasing their incomes and reducing poverty.

This literature further draws strength from the Stolper Samuelson theorem, according to which trade results in gains for labour, since this is the relatively abundant factor in most low-income countries. In this analytical framework, one can alternatively assume that there are two types of workers, high-skilled and low-skilled, with the latter being the relatively abundant factor of production in developing countries. Higher trade would benefit low-skilled labour-intensive production, hence increasing demand and wages of low-skilled workers in developing countries; since low-skilled workers are most likely to be in a situation of poverty, there would be a reduction in the number of poor people. Thus, according to traditional trade theories, the poor will be the greatest beneficiaries of trade liberalization in developing countries.

However, the restrictive assumptions upon which the theories are built are not sufficient to provide a viable interpretation of the complexity of the real world. They ignore the effects of complete specialization and intra-industry trade (which in many cases bypass the poorest countries). Furthermore, if one recognizes the possibility of different degrees of mobility of some or all factors over time, the income consequences of trade liberalization get further complicated. This is demonstrated by the fact that studies that estimate the effect of trade on the wages of skilled and unskilled workers arrive at ambiguous results. Krueger (1983) supports the traditional argument through a multi-country study on the effect of trade on wages and employment. However, Feenstra and Hanson (1996, 1999) find that outsourcing from North to South results in a rise in the real wages of skilled labour relative to that of unskilled workers in both sets of countries; but this is consistent with the fact that the real wages of unskilled labour rise as well.

Moreover, a strong limitation of the traditional theory is that although in the long run trade opportunities can have a major impact in creating more productive and higher-paying jobs, this strand of literature tends to take employment as given. A common finding is that many of the shorter-run impacts of trade and reforms involve reallocation of labour or wage impacts *within* sectors. This reflects a pattern of expansion of more productive firms (especially export-oriented firms or suppliers to exporters) and contraction/adjustment of less productive enterprises in sectors that become subject to greater import competition.

Using the above theory, it can be argued that exports may not be able to generate any additional new employment. However, an assumption of full employment is far from reality, especially given the vast supply of labour in the developing countries. Alternative frameworks have been developed dropping the assumption of full employment. Edwards (1993) provides an excellent survey of studies that have dealt with this issue. At the centre of this approach is the idea that exports contribute to

aggregate output in two fundamental ways: first, it is assumed that the exports sector generates positive externalities on non-exports sectors, through more efficient management styles and improved production techniques. Second, it is argued that there is a productivity differential in favour of the export sector. Thus, an expansion of exports at the cost of other sectors will have a positive net effect on aggregate output and employment.

The H-O model can at best be interpreted as a long-run rather than a short-run prediction. In the short run, even labour may be regarded as immobile, as people may have to acquire skills, undergo training and search for jobs before they move to the expanding labour-intensive sector. In such a scenario, international trade will be counterproductive, in the sense that it will serve to reduce the real return to labour. On another level, unionization of the labour force, minimum wage legislation and other government-mandated labour regulations may also dilute the benefits of trade, impede the frictionless clearing of labour markets, and contribute to the stickiness of wages.

Nevertheless, caveats such as those mentioned above do not deny the potential of international trade to benefit labour – at the most, they may postpone such benefits. Indeed, it is argued by some that labour market intervention can even facilitate adjustment, by protecting the well-being of workers. The resolution of these debates is essentially an empirical issue.

According to Winters (2004), wage responses to trade will also depend to a large extent on the elasticity of supply of labour in a country. If the elasticity of supply of labour is zero, wages will increase but employment will not, whereas if it is infinite, employment will increase but wages will not. In the case of the labour supply being perfectly elastic at the prevailing wage rate, which is the case in many poor countries, the effect on poverty will depend heavily on what the additional workers were doing before accepting these new jobs. If they were engaged in subsistence activities, there is no change in their situation. Only if the switch into this labour market were so great as to significantly reduce the labour supply to the subsistence sector and hence raise its wages, would there be a poverty impact.

The so-called “new trade theories” were developed in order to explain trade between countries with similar factor endowments that is characterized by intra-industry trade of similar (but differentiated) products. Input–output analysis conducted by Gera and Massé (1996) suggests that the importance of trade in the 1980s and 1990s accounts for a larger share of employment variations relative to other factors such as domestic demand and productivity than was the case during the 1970s. In the manufacturing sector, the study found that exports have become a dominant factor in employment growth in high-technology and skill-intensive industries, while import penetration adversely affected employment growth in low-technology, labour-intensive industries. This is consistent with international evidence which shows that trade has been associated with job losses in labour-intensive sectors such as textiles, clothing,

wood and leather (OECD, 1994, 1996). The available evidence also suggests that the net impact of trade on employment has been positive.

There is also evidence showing that the growing import content of exports has led to lower growth in export-related employment than might have been expected given the growth in exports as a share of output (Murphy, 1999). However, in the context of growing international specialization, it may no longer be appropriate to view imports from this narrow labour-market perspective, as necessarily destructive of jobs.

According to OECD (1996, 1997, 1998, 2000), trade is not the main driving force behind increased demand for skilled workers in developed countries. There is evidence that trade did contribute to the declining fortunes of low-skilled workers and increased income inequality in developed countries, but the effect was limited. With respect to developing countries, only limited literature is available.

Another way in which trade can affect the poor in a static framework is through macroeconomic policies that are followed to encourage trade. According to Bhagwati and Srinivasan (2002), trade helps in poverty reduction in the developing countries, since countries implementing an export-promoting (as opposed to an import-substituting) strategy will have to maintain macroeconomic stability. This reduces inflation fluctuations, to which the poor are most vulnerable. Therefore, greater orientation towards trade encourages countries to adopt macroeconomic policies which inadvertently favour the poor.

A major lacuna in the static approach is that by ignoring the existing dynamism in the economy, it is unable to suggest ways of using trade as a mechanism to alleviate poverty. The approach treats trade not as a means for attaining goals but as an end in itself. In predicting the effect of trade on labour, when using the H-O model, several caveats need to be kept in mind. This model relies on a series of other restrictive assumptions: constant returns to scale in production, competitive labour and goods markets, full mobility of factors within each country, and an inelastic supply of labour. The last assumption may not hold true in many developing countries. Thus, trade may result in higher employment but not in an increase in wages.

3.1.2 The trade–growth–poverty relationship: Dynamic framework

The dynamic approach to trade and poverty views trade as a vehicle for attaining higher levels of growth and thereby reducing poverty. Two kinds of relationship emerge in this approach, *trade and growth*; and *growth and poverty.* A stream of literature has emerged which debates these relationships.

Trade has long been regarded as an "engine of growth", and this role for trade has been supported by both theoretical and empirical literature. However, the net effect of trade openness on economic growth has been – and remains – a subject of controversy. On the theoretical side, since the time of Smith, through Ricardo and Solow, trade has been shown to allow a country to reach a higher level of income,

since it permits a better allocation of resources. The growth effects of trade openness are made much more explicit by the use of the new growth theory led by Romer (1986) and Lucas (1988). Within such a framework, trade allows an intensification of capacity utilization that increases production and consumption. Openness offers a larger market for domestic producers, allowing them on the one hand to operate at the minimum required scale, and on the other hand to reap the benefits from increasing returns to scale.

However, with the growing volumes of trade in the world in the last two decades, doubts have been raised not only about whether trade leads to growth or not but also about the direction of the relationship. It has been argued by some that faster-growing economies trade more, and therefore the relationship between trade and growth may not be one-way. New developments in growth theory provide an explanation for questioning the growth regression framework for dealing with complex relationships such as the openness–growth nexus. The effect of openness on growth depends on a country's structural and institutional conditions. Papers such as Chang, Katlani and Loayza (2005) and Dejong and Ripoll (2006) have attempted to take these contingencies into account.

The existing voluminous literature on trade and growth is complemented by an equally large existing literature on growth and poverty. It is asserted that if growth is distribution-neutral, and trade enhances growth, then it can be argued that trade is beneficial for poverty. However, the evidence, both theoretical and empirical, is much more complex than this. The trickle-down effect from growth to poverty reduction is based on the assumption that economic growth is distribution-neutral or, if not, distribution-improving. This is in contrast to the classical stylized facts theoretically consistent with Kuznets' (1955) theory of capital accumulation as an inverted-U shape between level of development and inequality. In contrast to the Kuznets hypothesis, Dollar and Kraay (2001a) find a one-to-one effect of growth on the income of the poor, so that the income distribution remains stable, and sometimes improves. Meanwhile, Ravallion (2001) uses World Bank data and computation methodology to argue that growth may have a differential impact on inequality in different countries. There is a need for micro-level analysis.

Alternatively, it is argued that although growth may be a necessary condition for poverty reduction, it is not a sufficient condition, since much will depend on its distributional aspects, which may not be equitable in a liberalized regime. Much of the recent research and debate has focused on the extent to which the poor benefit from economic growth (Ravallion and Chen 2003, Ravallion 2001, Ravallion and Datt 2000). One extreme of the debate argues that the potential benefits of economic growth to the poor are undermined or are offset by inadequate redistributive policies and by the increases in inequality that accompany economic growth. The second extreme argues that despite increased inequality, liberal economic policies and open markets raise the incomes of everyone in the society, including the poor. This proportionally reduces the incidence of poverty. Along with the extent of growth

effects on inequality, the direction of the impacts has also been debated, where it is argued that more inequitable distribution of gains leads to higher growth.

Apart from these debates, studies have traced the channels through which trade can affect poverty. Winters et al. (2004) identify four main channels through which trade shocks, including trade liberalization, are transmitted into poverty impacts. These include impact on wages and employment; prices of tradables; taxes and spending; and economic growth and technology. These impacts are transmitted through four groups of institutions, namely households; enterprises; distribution channels; government.

3.2 The trade–poverty relationship: Review of empirical literature

Some of the empirical studies in the last two decades that support the role of trade in boosting growth include those of David Dollar and Aart Kraay (2001). Using data for 80 countries over four decades reiterates the fact that openness boosts economic growth and that incomes of the poor rise one-for-one with overall growth. Frankel and Romer (1999) use data for 100 countries since 1960 and conclude that openness does have a statistically and economically significant effect on growth. Sachs and Warner (1997) find that developing countries with open economies grew by 4.5% per annum in the 1970s and 1980s, while those with closed economies grew by 0.7% per annum. According to this study, open economies double in size in 16 years, whereas closed ones take a hundred years. Winters et al. (2007) find evidence that trade liberalization in Viet Nam reduced poverty substantially over the period 1993-1998.

Studies that question the growth-enhancing role of trade include Harrison (1996), Barro (1999), Rodriguez and Rodrik (1999), Nye, Reddy and Watkins (2002), Rodrik (2000), and Rigobon and Rodrik (2004). These studies criticize the studies that establish links between trade and growth, for their alleged lack of control for "other" economic policies and use of largely unsatisfactory trade policy indicators. Rodrik (2005) debates the use of instrument variable strategy in regression analysis to arrive at the effects of government policies with respect to trade, on growth. Firstly, in this area of enquiry it is genuinely hard to find credible instruments that satisfy both the exogeneity and the exclusion requirement, and secondly, these regressions do not indicate how effective the *purposeful* policy interventions have been. Easterly (2004) emphasizes that the large policy effects uncovered in growth regressions are typically driven by outliers, which represent instances of extremely "bad" policies.

Furthermore, Rodriguez and Rodrik (2001) observe that most studies make use of complex indices to establish the relation between trade and economic growth. For example, they are skeptical about the index constructed by Sachs and Warner (1995) which includes information on average tariffs, non-tariff barriers, adoption of central planning, state monopolies of exports and the black-market premium. The link of the last two components to trade policy was questionable.

On the other hand, Frankel and Romer (1999) have constructed a variable – trade caused by geographical factors – to use as an instrument for trade/GDP ratios in a regression in which income levels are dependent. Although using this trade share in the regression gives significant results, the approach has been questioned on the grounds that the trade share may be acting as a proxy for geography's direct effect on growth, for example the effect of climate on disease, international technology transmission etc.

An interesting result by Warner (2003) shows that the unweighted average tariff rate on capital and intermediate goods did display a simple negative correlation with growth. However, by using different data sets for growth (Barro-Lee and Pen World Tables version 5.6 and 6.1), Rodriguez and Rodrik found that the results of Warner could not be replicated. The results were consistent with the idea that there is a weak, insignificant statistical relationship between growth and tariffs. Rodrik (2007) argues that poor countries need to design policies according to their unique situations to overcome their own highly specific constraints in order to benefit from trade.

However, the existing literature lacks the corresponding microanalysis of the impacts of trade liberalization on the wages and employment of the poor, which is required to trace the static and also dynamic effects of trade policy on household/individual welfare.

3.3. Review of empirical literature on the trade–growth–poverty nexus in India

With respect to India, empirical literature on trade–growth–poverty nexus is very limited. Topalova (2005) examines the differential impact of liberalization on poverty and inequality across Indian districts. She compares the poverty and inequality measures in the districts with industries that experienced greater liberalization (measured as a reduction in tariff barriers) to those whose industries remained largely protected. In the baseline specification, the district-level outcome of measures of poverty and inequality is taken as a function of the district's exposure to international trade. The regression equation also includes district-fixed effects, which takes care of unobserved district-specific heterogeneity and year dummies to control for macroeconomic shocks that affect the whole country equally. She arrives at the conclusion that lower levels of tariffs have been associated with significantly high levels of poverty (measured as the headcount ratio and poverty gap) for rural India. For the urban sector, however, no such significant relationship between trade liberalization and poverty was found. Similarly, she finds that there is no statistically significant relationship between trade exposure and inequality (measured as the standard deviation of log consumption and the mean logarithmic deviation of consumption) either.

Raghubendra Jha (2000) examines the impact of liberalization on poverty and inequality in India by analysing trends in aggregate inequality and poverty in India and outlining the major characteristics at the state level. He uses the headcount ratio, the poverty gap index and the Foster-Greer-Thorbecke measure as indicators of

poverty. Three sub-periods are considered: 1951-63, 1964-90, and 1991 onwards. He finds that in the period post-1991, inequality was severely exacerbated, and that poverty also rose due to the economic crisis of 1990-91 and subsequently declined albeit by a marginal amount.

Jha further uses changes in real wages as a proxy for movements in inequality and rural poverty. A regression equation with the real agricultural wage as the dependent variable and a time trend, inflation in the consumer price index for agricultural laborers, and a dummy for a good/bad monsoon year are taken as independent variables. He finds that although variations in monsoons account for some fluctuations, the real wages in agriculture have been increasing over time. Additionally, he finds that urban poverty has been higher than rural poverty, with urban poverty being highly associated (positively) with industrial growth. He also finds that there is no convergence between states in ranks and there is a weak level convergence in poverty, inequality and mean consumption in the urban and rural sectors.

Ramesh Chand (1999) analyses the impact of liberalization on four important crops in India – rice, maize, chickpeas and rapeseed-mustard – at the national and the farm level. In order to gauge the impact of trade liberalization on the above-mentioned crops, he calculates the Net Protection Coefficient (NPC), which is the ratio of the domestic wholesale price and the border price of a commodity for each of the four crops from 1987/88 to 1996/97. He concludes that trade liberalization would lead to a surge in exports of rice and maize, while rapeseed-mustard oil would experience a substantial increase in imports. He finds domestic prices and production for chickpeas would not undergo any significant change with trade liberalization.

He further estimates the impact of liberalization on producer and consumer surplus with the aid of demand elasticity, supply elasticity and price linkage functions for rice, maize and rapeseed-mustard (since these are the only crops that were found to experience a reasonable change in domestic prices and production). He finds that trade liberalization would lead to an increase in producer surplus for rice by Rs. 7,237 million while it would reduce consumer surplus by Rs. 7,545 million leading to a net decline in social welfare. For maize, on the other hand, the gain in producer surplus has been estimated to be double the loss in consumer surplus, leading to a substantial increase in social welfare. Rapeseed-mustard could either lead to a substantial increase in social welfare or a modest improvement in the same (two possible scenarios were discussed in the chapter). Thus, the impact of liberalization on social welfare would vary across commodities.

Gulati and Narayanan (2002) look at the impact of rice trade liberalization on poverty in various developing countries. This study gauges the impact of liberalization on domestic production of rice and on prices of rice, using an NPC analysis, and finds that India – along with Thailand and Viet Nam – would be the main exporter of rice in the medium-to-long run in the post-liberalization period. However, they stress the importance of looking at the lagged effect of trade liberalization on agricultural wages

and employment. They find that in India, the increase in the price of paddy for the period 1990/91 to 1999/2000 was accompanied by an increase in the wages of unskilled agricultural labour, an increase in private investment, and a decline in public investment (which was more than compensated by the increase in private investment).

As discussed earlier, this study takes an alternative approach: instead of estimating the impact of trade liberalization on poverty, it quantifies the impact of trade on the livelihoods of the poor through its impact on wages and employment. For this purpose, the impact of trade on the wages and employment of the poor in the unorganized sector of India is estimated, along with its impact on unskilled labour in agriculture and the organized manufacturing sector. The next section briefly reviews the existing studies in these areas.

3.4 The impact of trade on wages and employment in organized and unorganized sector in India: Existing studies

Trade can play an important role in labour markets, especially those of developing countries. By exposing the domestic industry to international and domestic competition, it may force firms to continuously improve their productivity and efficiency (Bloch and McDonald, 1999). Furthermore, the overseas markets also act as sources of new knowledge and skills. Though the impact of trade on labour productivity is generally agreed upon (except for the question of causality of the effect), the impact of trade on employment and wages is a much-disputed area.

There is an ongoing debate over the impact of trade on relative employment and wages. Ghose (2000) shows that in the case of industrialized countries, growth of manufactured imports from developing countries has a small adverse effect on manufacturing employment but virtually no effect on wages. However, in the case of developing countries, growth of trade has a large positive effect on manufacturing employment and wages. In addition, trade tends to lead to a decline in wage inequality, by increasing the demand for unskilled workers. Therefore, in some of these economies, growth of trade is associated with declining wage inequality. However, focusing on the short-run effects on labour markets, Greenway, Hine and Wright (2000) find a considerable positive impact from international trade on wages in the United Kingdom. In particular, trade competition from newly industrialized countries (NICs) in South-East Asia appears to have increased wage inequality.

With respect to India, most of the studies on the impact of trade on labour markets have been conducted for the organized sector, and have arrived at mixed results. The "organized sector" in India is defined by the size of the establishment in terms of the number of workers (10 or more workers). There are many regulations in India that apply only to the "organized sector", and some of these regulations are considered to be especially constraining to employers, leading to rigidities in labour markets. In particular, three types of regulations that are seen as constraining are: (a) fairly stringent rules relating to the firing of workers and also to the closing down of

enterprises, along with requirements for reasonable compensation for retrenchment; (b) laws governing the use of temporary or casual labour which enforce permanence of contract after a specified time of employment; and (c) minimum wage legislation that raises the cost of hiring workers. Given these rigidities in the organized manufacturing sector, it becomes interesting to compare the impact of trade on labour markets in the organized sector and the unorganized sector, where these rigidities do not exist.

With respect to the organized sector, Goldar (2002) found that employment elasticity for aggregate manufacturing increased from 0.26 in the pre-reform period (1973-74 to 1989-90) to 0.33 in the post-reform period (1990-91 to 1997-98). However, a significant increase in employment elasticity is observed only in export-oriented industries, as import competing industries revealed a fall in employment elasticity from 0.425 in the pre-reform period to 0.264 in the post-reform period. As regards trends in real wages, results showed that growth in real wages per worker declined appreciably, from 3.29 per cent per annum during the pre-reform period to 1.16 per cent per annum in the post-reform period.

In a similar vein, Tendulkar (2003) analysed organized industrial growth over three distinct policy regimes, i.e. 1973-74 to 1980-81, 1980-81 to 1990-91, and 1990-91 to 1997-98. He found that the period 1973-74 to 1980-81 was marked as a period of restrictive industrial and trade policies; the trend growth rate of output was 4.65 per cent, and employment grew by 3.83 per cent. Product wage per worker increased at 3.2 per cent, and implicit growth of productivity per worker was a negligible 0.8 per cent. The subsequent period, from 1980-81 to 1990-91, was a period of somewhat liberal trade and industrial policies, combined with an aggregate demand push provided by rising fiscal deficits and good agricultural harvests. It experienced jobless growth in manufacturing, indicating an output growth of 7.1 per cent. Real product wages grew by 4.5 per cent, compared to implicit growth of 7.3 per cent in productivity per worker. The last period, from 1990-91 to 1997-98 (i.e. the period when economic reforms were initiated) witnessed considerable improvements in both output and employment growth, at 9.0 and 2.9 per cent respectively, with a moderate product wage growth of 2.6 per cent.

In another study, Goldar (2004), while stressing the slowdown in productivity trends in post-reform periods in organized manufacturing, reiterated that the trend growth rate in employment from 1997-98 to 2001-02 was significantly negative – at about 3.3 per cent per annum. Furthermore, the trend growth rate in real value added during the same period was also very low, at about 0.5 per cent per annum, which was much lower than the trend growth rates in real value of output and the index number of industrial manufacturing production in this period, both exceeding 5 per cent per annum.

Goldar and Aggarwal (2004) examined the effect of tariffs and non-tariff barriers on manufactured imports on price-cost margins in Indian industries. The analysis, based on panel data for 137 three digit level industries for the period 1980-81 to 1997-98, indicated that lowering of tariffs and removal of quantitative restrictions on

manufactured imports had had a significant pro-competitive effect on domestic industries, tending to reduce mark-ups or price-cost margins. However, price-cost margins did not fall in the post-reform period in most of the industry groups. Rather, there had been a marked fall in the growth rate of real wages and a significant reduction in labour's income share in value added, perhaps reflecting a weakening of industrial labour's bargaining power. This seems to have neutralized, to a large extent, the depressing effect of trade liberalization on price-cost margins.

Vasudeva-Dutta (2004) empirically analysed the link between trade protection and inter-industry wage premiums in India using microeconomic data (NSS employment and unemployment surveys) for three years – 1983, 1993 and 1999. Inter-industry wage premiums were estimated using information on worker characteristics after controlling for potential selectivity bias for workers in two types of wage employment – regular and casual wage employment. The results show that there is substantial dispersion of wages across industries, although the inter-industry wage structure has remained relatively stable over time. The impact of trade liberalization on inter-industry wage premiums for regular workers is substantial, and more protected industries tend to have higher relative wages. Conversely, industries that undergo larger tariff reductions have lower wages relative to other industries. This positive tariff–wage effect is evident whether or not industry-fixed effects, such as productivity, skill intensity and average enterprise size, are included. This positive effect could reflect the erosion of rents that are received (and reflected in the wages earned) by unionized workers in imperfectly competitive markets following trade liberalization.

Banga (2006) examined the impact of exports on employment and wages in the organized sector for the period 1991-92 to 1997-98, using data for 78 industries. The results show that the export intensity of the industry has a significant positive impact on employment levels. However, the impact of export intensity on the wage rate of the industries is not found to be statistically significant.

In contrast to a large number of studies on the impact of trade reforms in the organized manufacturing sector, evidence of the same in the unorganized manufacturing is limited. Unni, Lalitha and Rani (2000) compared trends in growth and efficiency in utilization of resources in manufacturing at all-India level and for Gujarat before and after the reform periods. They found that both the organized and unorganized manufacturing sectors in Gujarat had done better in terms of growth in value added. In another study, Rani and Unni (2004) found initial economic reform policies to have adversely affected employment in the organized and unorganized manufacturing sectors, which improved in subsequent years. In addition, the reform measures that were initiated had a differential impact on various industry groups, with growth in automobiles and infrastructure enabling growth in the unorganized segment.

Marjit and Beladi (2008) argue that globalization increases the size of the informal sector. Liberal trade policy in the form of a decline in tariffs reduces open

unemployment and increases informal wages and informal employment under reasonable assumption if capital is mobile between the formal and the informal sectors. Marjit and Kar (2007) provide empirical evidence on the movement of real wages in the informal sector in India and how this affects poverty at the state level. The basic result on income mobility is corroborated by a primary survey in the province of West Bengal, for which they offer a descriptive analysis on household income levels in the province's informal manufacturing and service sectors.

Raj and Duraisamy (2006) analyse the efficiency and productivity performance of unorganized manufacturing in 13 major Indian states using a large-scale National Sample Survey data for five periods, broadly representing the pre-reform (1978-79, 1984-85 and 1989-90) and the post-reform (1994-95 and 2000-01) periods. The analysis, based on Malmquist productivity indices, shows that in all states but Rajasthan, on average, the annual rate of total factor productivity growth has been higher in the reform period than in the pre-reform years. The better performance of unorganized manufacturing was due to good progress made in technical efficiency rather than to technological progress; this has been a major factor in achieving high levels of total factor productivity during the reference period.

On a somewhat different but related note, Rao (1994), Datt (1999), Papola (1999) and many others have contended that the policy shift towards greater openness is inherently biased towards organized industry and better-skilled people in the urban sector. As a result, trade has a more substantial impact on the urban economy than on the rural economy in India. Notably, rural areas are inhabited by a large proportion of poor who earn a meagre livelihood and are engaged primarily in the unorganized sector, which is characterized by inadequate social security benefits, job insecurity, poor working conditions, and a weak asset and resource base. This would imply that rural non-farm enterprises may not be able to compete and share the gains expected from the reform process.

Based on these findings, two points can be put forth. Firstly, trade liberalization has had a favourable effect on Indian organized manufacturing towards improving its competitive strength by enhancing labour productivity. Secondly, the response of employment and wage rates to economic reforms and liberal trade policies is mixed for the organized manufacturing sector. Differences in estimates could be due to different time periods taken in the analysis, and to the fact that not enough studies have been undertaken on the subject to arrive at a consensus.

It is important to reiterate here that most of the findings with respect to the impact of trade liberalization on labour markets pertain mainly to the organized manufacturing sector, as not many studies have been undertaken in this context for unorganized manufacturing. Most of the available studies have estimated the impact of reforms merely by comparing the trends and growth performance of labour market characteristics in the pre- and post-reform periods. In doing so, the studies have not tried to capture the effect of exports and imports on employment and wage rates. Also, since unorganized manufacturing is heterogeneous in nature (i.e. across

industries, states and rural-urban location), the impact of trade at such a disaggregate level is not yet known. For sure, literature abounds with an exploration of rural and urban labour markets at district and state level, focusing on diverse aspects, namely employment, and wage patterns, and their linkages with poverty and growth, separately in the farm and non-farm sectors. However, in most of the studies, the non-farm sector is studied as a whole, of which unorganized manufacturing constitutes just one of the economic sectors.[3]

3.5 Impact of trade on labour productivity: Existing literature

In the analysis of the potential link between trade and economic growth, one of the directions in which research has proceeded is to investigate the microeconomic link between trade and firms' productivity. Studies attempt to explore whether firms with higher productivity growth become exporters, or whether the productivity of firms increases as a result of more intense domestic competition from imports due to external markets when they enter export markets.

The impact of trade on labour productivity needs to be analysed with care, for it is possible that higher labour productivity may lead to higher trade. Frankel and Romer's (1999) pioneering work on the casual effect of trade on average productivity across nations was based on the perception that trade is partly determined by the location characteristics of countries. They examined this idea empirically for a large set of countries in 1985, and concluded that trade has a positive effect on average labour productivity. Kraay (1997) found that, controlling for firms' past performance and for unobserved characteristics of firms, past exports are a significant indicator of an enterprise's current performance. The estimated coefficient indicates that a 10 percentage point increase in a firm's export-to-output ratio in a given year causes a 13 per cent increase in labour productivity.

Trade exposes firms to the latest available technology. Exposure to international markets may provide a network for sources of new knowledge and new techniques. These may have positive effects on labour productivity. Bloch and McDonald (2000) have analysed this issue. They found that the labour productivity in manufacturing firms in Australia increased with increased exposure to exports. Alcala and Ciccone (2001) ascertain the effect of trade on average labour productivity across countries. Their findings show that the causal effect of trade on labour productivity is large, highly significant and very robust. They examined the channels through which trade affects average labour productivity, and found that trade works through total factor productivity. They also found that average labour productivity is influenced in a statistically significantly way by the size of a country's workforce once international trade is taken into account.

[3] See, among others, Chadha (2003); Bhalla (2005); Srivastava and Singh (2005); Sundaram (2007); Singh (2008) for a detailed exposition on the subject. The analysis is largely based on various rounds of quinquennial NSS employment-unemployment surveys.

A study by Douglas (2003) on the impact of the United States–Canada FTA on Canadian manufacturing suggests that tariff reductions helped boost labour productivity by a compounded rate of 0.6 per,cent per annum in manufacturing as a whole, and by 2.1 percent per annum in the most affected (i.e. high-tariff) industries. These productivity effects were achieved by a mix of plant turnover and rising technical efficiency within plants. By increasing productivity, the FTA also helped to increase the annual earnings of workers. Another study by Doyle and Zarzoso (2005) used the real openness measure as a determinant of labour productivity in a cross-country setting over 1980-2000. This study suggests that a 1 per cent increase in real openness increases labour productivity only by 0.55 per cent.

Banga (2005) found that exports raised labour productivity in Indian manufacturing industries. Higher competitive pressures have driven firms to improve their productivity. It is also found that the import intensity of an industry, which is measured in terms of effective rate of protection, has a strong positive effect, indicating that the higher the extent of imports, the higher labour productivity will be.

3.6. Impact of trade on wage inequalities: Existing literature

Very few studies exist that examine the relationship between trade and wage inequalities. One of the first attempts at a trade-based hypothesis to explain increased differentials between skilled and unskilled workers was made by Bhagwati and Dehejia (1994). The authors argued that increased economic integration had increased the volatility of comparative advantage. This had led to increased labour turnover, reducing the relative wages of the less skilled. There may be two reasons for these results: either they have skills that are less transferable than those possessed by skilled workers, or they are less likely than high-skilled individuals to invest in skill improvements during jobless spells. Some empirical support for this hypothesis, for Canada, was found by Zalkiwal (2000).

Durevall and Munshi (2006) have explored the relationship between trade liberalization and skilled–unskilled wage inequalities in Bangladesh's cotton textile industry. Their major finding is that opening up to international trade has affected unskilled and skilled wages in the same way: there is no reduction or increase in wage inequality. Moreover, trade opening seems to have increased real wages across the board, possibly because of trade-induced increases in productivity.

By contrast, Mishra and Kumar (2005), in their study for India, found a strong, negative and robust relationship between changes in trade policy and changes in industry premiums over time. They conclude that trade liberalization has led to decreased wage inequalities between skilled and unskilled workers in India. According to them, as tariff reductions were relatively large in sectors with a higher proportion of unskilled workers, and these sectors experienced an increase in relative wages, unskilled workers have experienced an increase in income, relative to skilled workers. Thus, the findings in this paper suggest that trade liberalization has led to decreased wage inequalities in India.

Similarly, Banga (2005a) found that higher export intensity of an industry is associated with lower wage inequalities. As most of the exports take place from low-skill and labour-intensive industry, by raising the demand for low-skilled labour, higher exports increase their returns, and subsequently reduce the wage gap. However, as technological progress is skill-biased, a higher level of technology acquisition is found to be associated with higher wage inequalities.

Wage inequality between skilled and unskilled labour can have important implications for the sustainability of gains from trade. Higher exports may increase the demand for unskilled labour and increase their returns, but it becomes imperative to establish supporting empirical evidence. It may be the case that in order to sustain competitiveness, which arises due to low labour costs, higher exports may further suppress the incomes of unskilled labour.

3.7 Gender impacts of trade: Review of literature

Most of the studies that estimate the impact of trade on gender employment conclude that trade liberalization does not have a gender-neutral impact. Depending upon the intensity of employment of women in the export and import sectors of the economy, trade may favour employment of one gender over the other. However, the extent of the impact may differ considerably across sectors and countries. In this context, it is useful to briefly review the existing literature and to highlight gender-neutralizing trade policy implications of the studies. For India, only limited empirical literature is available, given the lack of availability of comparable gender and trade data.

Menon and Rodgers (2006) address the question of whether increasing trade liberalization affects the wages of male and female workers differently. Their study demonstrates that although an increase in trade still has a mitigating effect on the gender wage gap (neoclassical), under certain conditions, the net effect may be that of a widening of the wage gap between male and female workers (non-neoclassical). The theory is tested by estimating the impact of trade reforms on gender wage differentials using four cross-sections of household survey data from the National Sample Survey Organization between 1983 and 2004. The results indicate that increasing openness to trade is associated with a widening of the wage gap in India's manufacturing industries.

Raihan et al. (2007) explore the gender aspects of policy reforms in Bangladesh in a sequential dynamic computational general equilibrium (CGE) framework. The research performs two simulations to examine the impact of (a) domestic trade liberalization in Bangladesh; and (b) the phasing out of the Multi-Fibre Agreement (MFA) on textile and garments. It further builds a gendered social accounting matrix (SAM) for the year 2000, and uses it in a sequential dynamic computable general equilibrium framework.

It is found that domestic trade liberalization leads to a significant expansion of the readymade garment sectors in the economy, as a result of which the share of market labour supply of unskilled female labour increases. However, this results in a fall in the shares of domestic labour supply and leisure of unskilled female members of the households. A fall in the share of leisure time may have significant negative implications for the time spent on education by this labour category. It is also observed that the long-run impacts are different from the short-run impacts with respect to the magnitude of the effects. In the case of second simulation, it is noted that the phasing out of the MFA works in completely the opposite direction. The share of market labour supply of unskilled female members of the households decreases, and the shares of domestic work and leisure increase for most of the households both in the short and the long run.

USAID (2006) examines the impact of trade liberalization on growth, employment and poverty in South Africa. More specifically, by using the dynamic general equilibrium and micro simulation model, the study attempts to show how trade influences the process of growth and reduces inequality in job opportunities between men and women. The study finds that trade liberalization has contributed positively to the growth, by inducing trade-related technological improvement. At the same time, however, it has increased income inequality between men and women. It is argued that while men and women both benefit from trade-induced growth, it is male-headed households that have benefitted more from rising factor incomes.

Riddle (2004) undertakes a detailed analysis of the gender impacts of trade in services across 74 developing countries, including 20 of the least developed countries. The study examines potential links between liberalization of trade in services, and development, focusing on the central role of services in all economies – with many of the service suppliers being women. It is noted in the study that any growth in services, whether domestic or through trade, will not in itself ensure equity or an improved quality of life for girls and women. The study concludes that in order to maximize the development benefits of trade in services, the focus needs to be on strengthening the ability of developing economies to ensure and implement gender-sensitive employment, pay-equity legislation, and effective domestic regulatory reforms, prior to further liberalization of trade in services.

Williams (2002) examines tourism and development from the perspective of social and gender equity, and finds that the issue is multi-dimensional. The study argues that tourism growth may increase competition with other sectors such as domestic agriculture and other export areas. Most of these sectors provide wages for women, and therefore it might be possible that tourist development may not be in line with social and sustainable development. In addition, it has been argued that there are significant gender biases and inequalities, which may predispose women to greater vulnerabilities and constraints in enjoying the presumed benefits of tourism development and to disproportionately shouldering the negative consequences of adjustments.

Anh-Nga Tran-Nguyen (2004) emphasizes that international trade influences the growth process and gender equality in positive as well as in negative ways. Positives from trade are the enlargement of markets and an exchange of technology and information, thereby contributing to growth and development. Trade benefits all – men and women. However, within the same country, benefits are distributed differently between men and women, because the society assigns them different roles. Implementation of multilateral trading rules should, therefore, provide governments with enough policy and regulatory space for pursuit of the gender-equality objective.

Korinek (2005) examines ways in which greater integration through trade affects women and men differently, which may have implications for growth. The paper finds that trade creates jobs for women in export-oriented sectors. Jobs that bring more household resources under women's control lead to greater investments in the health and education of future generations. Women also have less access to productive resources, time, and particularly – in many developing countries – to education. Professional women continue to encounter discrimination in hiring and promotion, including in OECD countries. Once different impacts are ascertained, well-designed policy responses may aid women in taking advantage of greater openness to trade.

Grown (2005) explores the linkages between trade liberalization and the provision of – and access to – sexual and reproductive health services. The study finds that trade liberalization can possibly create new opportunities for improving reproductive health, but at the same time, it can also make it more difficult to advance reproductive/sexual health and rights objectives in policies, programmes and services. There are two ways in which trade affects health. Direct pathways, through trade policies such as GATS and TRIPS, affect the supply of reproductive health services by possibly interfering with national health policies and by increasing costs of reproductive drugs, supplies and vaccines. Secondly, trade policies and movements in goods and services affect women's demand for services indirectly through changes in their labour force participation.

The above review of literature on gender impacts of trade highlight that trade liberalization tends to have asymmetrical impacts on men's and women's employment and working conditions. Some of these impacts are positive for women while others can be negative. The balance of the different impacts and mechanisms can only be determined in specific contexts and country circumstances.

CHAPTER IV: IMPACT OF EXPORTS ON ECONOMY-WIDE EMPOYMENT AND INCOMES

4.1 Introduction

Traditional trade theories, such as the Heckscher–Ohlin–Samuelson (H-O-S) framework, suggest that trade will lead to labour-abundant countries exporting labour-intensive goods. This will result in a redistribution of employment from the import sector towards the export sector. Therefore, according to the traditional theories, due to full employment assumption, trade may not generate additional employment but may lead to redistribution of labour force towards export-intensive sectors. Any changes in employment will be only in the short run. However, dropping the assumption of full employment, alternative frameworks have been developed which suggest that trade and trade policy can affect employment permanently with little or no adjustment in the economy.[4] Empirical literature finds the impact of trade/trade policy on employment and wages to be country- and sector-specific.

Ghose (2000) shows that in the case of industrialized countries, growth of manufactured imports from developing countries has a small adverse effect on manufacturing employment, but virtually no effect on wages. However, in the case of developing countries that have emerged as important exporters of manufactures to industrialized countries, growth in exports has a large positive effect on manufacturing employment and wages.

Danthine and Hunt (1994) point out that, while Marshallian pressures would be expected to decrease wages, as competition in the product market increases, an increased integration will also effectively reduce the degree of centralization of bargaining. This can lead to either increases or decreases in union wage demands, depending on the initial bargaining structure of the country concerned. Focusing on the short-run effects on labour markets, Greenaway, Hine and Wright (2000) find a considerable impact from international trade on wages in the United Kingdom. Trade competition from newly industrialized countries (NICs) in South-East Asia appears to have increased wage inequality.

[4] For further discussion on this see Appendix I, section A-8 (III).

However, no consensus has been reached in the literature so far regarding the impact of trade on employment and wages in developing countries.[5] This chapter quantifies the impact of the rise in exports in the period 2003-04 to 2006-07 on economy-wide employment. It further computes the extent to which exports in this period have generated incomes for five income groups, including those below the poverty line and those under abject poverty. Thereafter, the impact of the global slowdown on employment is estimated. While exports may have generated significant employment during the period of high export growth, it is also important to quantify the extent of job losses during the downturn in export growth.

Section 4.2 presents the estimates of employment generated in 46 sectors of the economy due to rises in exports in the period 2003-04 to 2006-07. Section 4.3 computes the incomes generated for the poor by this rise in exports, and section 4.4 presents the results of the impact of the global slowdown on employment in 10 broad sectors of the economy. Section 4.5 summarizes and concludes.

4.2 Impact of exports on economy-wide employment

In order to quantify the export-generated employment in India and to estimate the extent to which exports generate incomes for the poor, a Social Accounting Matrix (SAM) has been used. The details of the methodology are reported in Appendix I (section A.2.1).

To estimate the impact of exports in the period 2003-04 to 2006-07, increases in exports in this period across 46 subsectors[6] of the economy are recorded and corresponding rises in output in each of the sectors are traced. It should be noted that an increase in output in a particular sector might not equal an increase in its exports. A rise in output due to increased exports of any sector will be caused due to an increase in its demand as well as an increase in the demand for goods that use the sector's output as intermediary goods. In other words, a rise in exports in the exportable sector will also lead to a rise in output from the other sectors that provide inputs to the exportable sectors. For example, a rise in exports of food products will generate a demand for food crops and lead to a rise in the output of food crops.

After arriving at the actual increase in output in different sectors of the economy due to increased exports in the period 2003-04 to 2006-07, employment multipliers are applied to the rise in output levels. The employment multiplier of a sector can be defined as the extent to which employment is generated by a unit increase in output of the sector. As in the case of output increases, an employment increase in a sector will include both direct as well indirect increases in employment generated by exports.

[5] For detailed review of literature see section 3.4

[6] The three sectors, namely agriculture, industry and services, are divided into 46 sub-sectors according to the input-output tables. These sub-sectors are referred to as 'sectors' in the chapter.

Summing across sectors gives the total employment generated in the economy due to rises in exports.

To estimate the output generated by increases in exports across different sectors, an input-output matrix for the year 2003-04 is used. The rise in real exports and the corresponding rise in output, including both direct and indirect, in 46 sectors, is presented in Annex Table IV.1.

It is interesting to note that in this period, exports increased substantially for food products (nearly double) and crude petroleum and natural gas (more than double). Exports generated both direct and indirect demand. Change in output therefore reflects change in demand for the product for final consumption as well as for intermediate consumption.

Across sectors, we find that the output generated due to rises in exports has been highest for the manufacturing industry. Industry's share in total output generated is 53%, followed by services (42%) and then agriculture (5%). Within industry, metals (17%) and rubber, petroleum and chemicals (14%) had high shares in output generated. Within services, maximum output was generated for other services (34%), followed by trade (16%), and other transport services (12%).

Annex Table IV.2 reports the output and employment multipliers based on 2003-04 across sectors. Given high employment in the agriculture sector, we find that employment multipliers are highest for food crops (8.56), followed by wood and furniture (3.14) and plantation crops (2.34). Within the manufacturing sector, high employment multipliers are found for cotton textiles, jute, hemp and mesta textiles, and other textile products. Within the services sector, construction, domestic trade and tourism are found to have high employment multipliers.

Applying employment multipliers to rise in output, rise in employment due to rise in exports in the period 2003-04 to 2006-07 is generated for 46 sectors. The results are presented in Table 4.1. The results show that total employment generated in the economy by rise in exports in the period 2003-04 to 2006-07 was around 26 million person-years. This implies that exports in this period generated employment of around 26 million person-years, averaging around 6.5 million person-years every year.

It has been argued that that services sector growth in the 1990s was a "jobless growth". However, using this methodology for the period 2003-04 to 2006-07, we find that the maximum employment generated by exports in this period is in services (12 million); followed by industry (7 million) and then agriculture (6 million).

Within the services sector, the maximum employment is generated in the domestic trade sector, which comprises wholesale and retail trade (4 million person-years), followed by other services (3.95 million person-years) and food crops (3.23 million person-years). It needs to be noted that there has been no change in exports of food

crops in this period. However, given the intersectoral linkages (particularly with food products, and hotels and restaurants) and the high employment multiplier in food crops, an increase in the output of this sector due to increases in exports from other related sectors generates high employment in this sector.

Table 4. 1: Increase in employment due to increase in exports from 2003-04 to 2006-07

Sectors	Increased employment from 2003-04 to 2006-07 (in millions of person-years)
Food crops	3.23
Cash crops	1.65
Plantation crop	0.47
Other crops	0.27
Animal husbandry	0.19
Forestry and logging	0.2
Fishing	0.03
Coal and lignite	0.17
Crude petroleum, natural gas	0.08
Iron ore	0.04
Other minerals	0.83
Food products	0.45
Beverages, tobacco, etc.	0
Cotton textiles	0.55
Wool, silk and synthetic fibre	0.26
Jute, hemp, mesta textiles	0.06
Textiles products including wearing apparel	0.9
Wood, furniture etc.	0.82
Paper and printing etc.	0.11
Leather and leather products	0.14
Rubber, petroleum, plastic, cola	0.18
Chemicals etc.	0.22
Non-metallic products	0.1
Metals	0.59
Metal products except mach. and tpt. equipment	0.29
Tractors, agri. implements, industrial machinery, other machinery	0.34
Electrical, electronic machinery and applications	0.02
Transport equipments	0.06
Miscellaneous manufacturing industries	1.18
Construction	0.27
Electricity	0.21
Gas and water supply	0.02
Railway transport services	0.28
Other transport services	1.68
Storage and warehousing	0.01

Communication	0.25
Trade	4.06
Hotels and restaurants	0.93
Banking	0.37
Insurance	0.09
Ownership of dwellings	0
Education and research	0
Medical and health	0
Other services	3.95
Public administration	0
Tourism	0.43
Total	**25.97**

4.3 Impact of rise in exports in 2003-04 to 2007-08 on incomes of the poor

The extent to which the rise in exports in the period 2003-04 to 2006-07 generated incomes for the five income categories is presented in Table 4.2[7]. The income categories are reported for rural and urban households separately; where RH1 and RH2 are the income categories of rural households "under abject poverty" and "below the national poverty line" respectively, and UH1 and UH2 are income categories in urban households, which are "under abject poverty" and "below the national poverty line" respectively.

The results show that the total income generated by the increase in exports in the period 2003-04 to 2006-07 was of Rs 2,364 billion, equivalent to $55 billion. However, within rural areas, we find that the distribution of income has not been in favour of people in abject poverty, i.e. in income groups RH1. Out of the total income generated in rural areas due to exports, only 2% reaches the RH1 income group (the poorest of the poor); while 7% of the total income generated is for the income group RH2. Together, the low-income groups in rural areas get less than 10% of the total income generated in the rural sectors because of the rise in exports.

In the case of urban sectors, we find that the situation is not much different. In fact, the income generated by exports for the UH1 income group (people in abject poverty) is only 1.4% of the total income group, while UH1 and UH2 together have around 7% of the total income generated, as in the case of rural areas.
Total income generated for the people in the lowest income group (RH1 and UH1) is around 1.6% of the total income generated in the economy by the rise in exports in the period 2003-04 to 2006-07. The highest income group (RH5 and UH5) gets around 40% of the total income generated by exports, while 70% of the total income generate goes to the top two income groups (rural and urban taken together).

[7] The details of the methodology are reported in Appendix I, section A.2.2.

Table 4.2: Increased value added and household-wise increased income due to increase in exports

	Increased income from 2003-04 to 2006-07
	Rs billion
Labour	1366.22
Capital	1559.19
RH1	**24.00**
RH2	**92.09**
RH3	289.08
RH4	360.34
RH5	504.27
UH1	**15.41**
UH2	**64.58**
UH3	262.24
UH4	311.78
UH5	440.51
Total increase	2364.3

RH1 and RH2: people under abject poverty and below the poverty line in rural areas.
UH1 and UH2: people under abject poverty and below the poverty line in urban areas.

The results, therefore, indicate that exports from India have been able to increase employment across sectors, and the incomes of the poor. **However, the gains from exports in terms of higher incomes have not percolated down to the poor.** The incomes of the poor and the poorest of the poor have increased, but it is a very small proportion of the total increase in incomes generated by exports. Therefore, a major policy challenge is to improve the distributional impact of increases in incomes arising from exports.

4.4. Impact of the Global Slowdown on India's exports and employment

The increased integration of world markets over the past few years has transmitted, among other things, economic crisis from one country to the other. The larger the economy where the crisis originates, the greater the impact is on other countries. The United States – the largest economy in the world, both in terms of its share in world GDP (27%) and in global imports (17%) – experienced the sub-prime mortgage collapse in August 2007. This was followed by the reversal of the housing boom in other industrialized economies, which had a ripple effect all around the world. Furthermore, integrated financial sectors unmasked other weaknesses in the global financial system, as a result of which some of the financial products and instruments became so complex and twisted that as things started to unravel, trust in the whole system started to fail. Stock markets crashed all over the world, with declines ranging from 35 to 40% in developed countries and even more in most emerging markets.

One of the most important channels through which the financial crisis erupting in the United States and other advanced economies was transmitted to developing countries was through international trade. Apart from the direct impact of lower demand for exports from developing countries by advanced economies, the impact of the slowdown can be transmitted through three other major channels of trade. These are through third market effects, supply chains, and contraction of trade finance. The third market effects are referred to in the literature as "echo effects", which work through the trading partners of the country where the slowdown occurs. Apart from the direct effects on developing countries of lowering of exports to advanced countries with lower GDP growth, there is an indirect effect through lower demand from trading partners of the advanced countries. This leads to a second round of slowdown of demand for exports of developing countries.

International vertical supply chains are also adversely affected, and developing countries, which are a part of these supply chains, feel the impact of lowering of demand for their exports to other developing countries, which in turns leads to lower import levels. In addition to these, trade finance squeezes due to tighter financial markets can lead to substantial supply-side effects. However, the impact of a slowdown may be felt differently by different countries – depending on the nature of their exportable products, the destination country of the exports, and the overall dependence of the economy on exports. Furthermore, the higher the income elasticity of demand for a country's exports, the higher the adverse impact of lower GDP growth of its trading partners will be.

One of the unique features of the United States economy is its high income elasticity of imports.[8] Three decades of econometric modelling[9] show that the income elasticity of imports in the United States is greater than 1. While estimates vary, it is generally found that for every 1% increase in United States income, import demand increases by 2.2%. The implication of this is clear: a 1% slowdown of GDP in the United States will decrease import demand by 2.2%. This can rapidly transmit the United States' slowdown into the countries that have the United States as a major market for their exports.

India is one of the many developing countries which have relied heavily on the United States and other advanced economies for its exports. In 2007, around 17% of India's exports sought United States markets, while 29% were directed to G7 countries,[10] and around 58% of the exports were directed towards advanced countries (as defined by IMF). Given such heavy reliance on advanced economies' markets, India has not been able to remain insulated in this global decline, especially in the trade sector.

[8] where income elasticity of import/export is defined as percentage change in growth of imports/exports for one percentage change in growth in its income or GDP.
[9] Magee (1975), Sawyer and Sprinkle (1996), Marquez (2001)
[10] G7 countries are as defined by IMF.

A close look at India's trade sector indicates that in real terms, growth in India's exports and imports in both goods and services has declined (Table 4.3). Growth in exports of goods in real terms declined from 17.8% in 2006-07 to 5.4% in 2007-08. Maximum decline is witnessed in growth of exports of services, which grew at the rate of 26.8% in 2005-06 but experienced a negative growth of -1.8% in 2007-08. Growth in imports of goods declined from 25.2% in 2005-906 to 10.6% in 2007-08. India's GDP growth was estimated to be 9.2% in 2005-06, which increased to 9.7% in 2006-07 but declined to 9.2% in 2007-08.

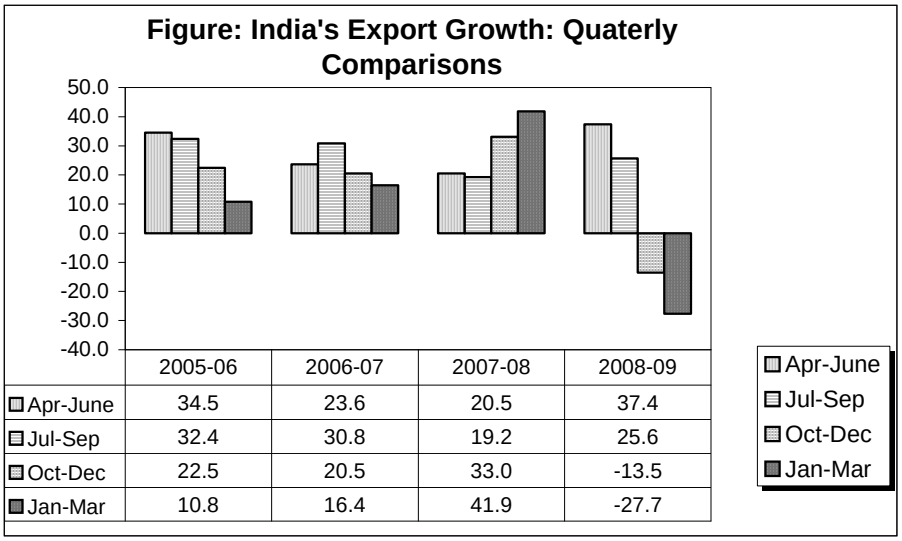
Table 4. 3: Growth in India's trade (in real terms): 2005-06 to 2007-08

	2005-06	2006-07	2007-08
Exports of goods	17.2	17.8	5.4
Exports of services	26.8	27.4	-1.8
Imports of goods	25.2	17.9	10.6
Imports of services	17.8	24.0	-3.7
Real GDP at market prices	9.2	9.7	9.2

Source: National Accounts Statistics, CSO and RBI.

The quarterly trend shows that export growth became negative for the first time since 2005-06 in the third quarter (Oct-Dec) of 2008-09. Further, in the last quarter of 2008-09 (Jan-March 2009) there was a much steeper fall of -27.7%. The impact of the slowdown was therefore felt in India from October 2008.

Figure 4. 1: India's export growth 2005-06 to 2008-09



	2005-06	2006-07	2007-08	2008-09
Apr-June	34.5	23.6	20.5	37.4
Jul-Sep	32.4	30.8	19.2	25.6
Oct-Dec	22.5	20.5	33.0	-13.5
Jan-Mar	10.8	16.4	41.9	-27.7

Source: DGCI&S

Given the high dependence of the Indian economy on its external trade sector, where the export of goods and services (less export-related imports) is around 20% of GDP, a slowdown in the trade sector can have adverse ripple effects in the economy. More importantly, it can lead to job losses and an increase in the number of poor in the country. The job losses may be direct, due to contraction in output in the exportable sectors, and indirect, which may occur due to decline in output of the sectors that provide inputs to the exportable sectors. The increase in cheaper imports, particularly of inferior goods (the demand for which increases with lowering of incomes), can further add to the contraction of output and employment in the economy.

To estimate the extent of employment loss due to the global slowdown in India, the change in total export growth and export growth across 10 major sectors in 2008-09 over 2007-08 (in Table 4.4) has been used to estimate total employment loss and employment loss in 10 major sectors of India. Details of the methodology adopted are reported in Appendix I (section A.3).

Table 4. 4: Export growth in 2007-08 and 2008-09 in 10 major sectors

	Export growth in 2007-08	Export growth 2008-09 over 2007-08
1Textiles and textile products	15.7	-8.9
2.Ore and minerals	30.4	-12.3
3.Leather and leather products	16.3	2.5
4.Marine products	-2.6	-4.4
5.Agriculture	55.6	2.6
6.Plantation	11.6	54.6
7.Engineering and electronics	26.6	22.0

8.Chemicals and products	21.5	9.7
9.Gems and jewellery	23.3	-4.9
10.Petroleum products	52.0	4.7
Total sectors	**29.1**	**3.40**

Source: DGCI&S.

The impacts of the global slowdown on India's employment are presented in Table 4.5. The estimates show that in the year 2008-09, with export growth of 3.4%, the total job loss in India due to lower export growth was of around 1.16 million person-years. However, since the impact of the slowdown on India's exports only began to be strongly felt as of October 2008, the net employment created by exports in this year was positive, i.e. 1.25 million person-years. Sector-specific employment changes show that maximum job losses have occurred in textiles and textile products (559,621); followed by ores and minerals (373,023); and gems and jewellery (217,157).

Table 4. 5: Impact of the slowdown on employment: 2008-09 to 2010-2011

	Employment change in 2008-09 (person-years)
Ores and minerals	-373,023
Textiles products	-559,621
Leather and products	30,787
Marine products	-16,498
Agriculture	373,148
Plantation	1,275,376
Engineering	665,445
Chemicals and products	45,114
Gems and jewellery	-217,151
Petroleum products	33,749
Net employment	**1,257,327**
Job loss	**-1,166,293**

4.5. Summary and conclusion

To assess the role played by exports in generating employment and incomes in India, economy-wide as well as sector-wide analyses have been undertaken. The results are the following:

- The total increase in employment generated by the rise in exports in the period 2003-04 to 2006-07 was around 26 million person-years.

- The maximum employment generated by the rise in exports is in the services sector, which is 12 million; followed by the industrial sector (7 million), and then agriculture (6 million).

- The results show that the total income generated by increases in exports in the period 2003-04 to 2006-07 was of Rs 2,364 billion, equivalent to $55 billion.

- However, the gains from exports in terms of total income generated have been lopsided. *Low-income groups in rural areas get less than 10% of the total income generated in the rural sectors because of rise in exports.* In the case of urban sectors, we find that the situation is not much different. In fact, income generated by exports for people in abject poverty is only 1.4% of the total income generated, while people below the poverty line get around 7% of the total income generated as in the case of rural areas. *Total income generated for the people in the lowest income group, i.e. taking rural and urban households together (RH1 and UH1) is around 1.6% of the total income generated in the economy by rise in exports* in the period 2003-04 to 2006-07. The highest income group (RH5 and UH5) got around 40% of the total income generated by exports, while 70% of the total income generated went to the top two income groups (rural and urban taken together).

- India has not remained insulated from the global slowdown. The impact of global slowdown was felt as of October 2008.
- In the year 2008-09, with export growth of 3.4%, the total job loss in India due to lower export growth was around 1.16 million person-years However, since the impact of the slowdown on India's exports was felt strongly only since October 2008, the net employment created by exports in this year was positive, i.e. 1.25 million.
- Sector-specific employment changes show that maximum job losses have occurred in textiles and textile products; followed by ores and minerals; and gems and jewellery.

The broad conclusion that emerges from the results is that exports have played a significant role in India. They have generated employment and incomes for the poor. However, the share of poor in total incomes generated from exports is marginal.

Trade policies are rarely formulated with the objective of reducing poverty. However, trade policymakers can use trade policy as an instrument for generating employment and incomes for the poor. Given the fact that there will always be winners and losers in the process of liberalization, it is not the net positive impact of trade on poverty that should be the goal of trade policy, as it may not be desirable to compare the gains to losses. What needs to be focused on more is to increase exports in the sectors that have large employment multipliers. Policy interventions are required for distributing the incomes generated from exports more equitably across all income groups. Efforts are needed to percolate the incomes generated from exports to the poorest of the poor and people in abject poverty. Participation by the poor in the exportable sectors, or in sectors that provide inputs on a large scale to the exportable sectors, is a prerequisite for the poor to gain from trade.

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ANNEX IV

Table IV.1 Exports and increase in output across sectors: 2003-04 to 2006-07

S.No		Exports 2003-04	Exports 2006-07	Increased output from 2003-04 to 2006-07
		Rs billion	Rs billion	Rs billion
1	Food crops	61.2	61.2	42
2	Cash crops	17.5	32.9	83
3	Plantation crop	1.8	2.5	21
4	Other crops	35.4	81.6	165
5	Animal husbandry	17.8	20.9	50
6	Forestry and logging	11	17.2	22
7	Fishing	39.7	42	7
8	Coal and lignite	1.6	1.6	96
9	Crude petroleum, natural gas	1.9	4.4	375
10	Iron ore	27.5	50.5	35
11	Other minerals	231.5	231.5	42
12	Food products	164.3	302.2	178
13	Beverages, tobacco etc.	3.4	4.4	6
14	Cotton textiles	78	116.7	91
15	Wool, silk and synthetic fibre	58.7	80	55
16	Jute, hemp, mesta textiles	3.9	6	12
17	Textiles products including wearing apparel	358.6	501.4	163
18	Wood, furniture etc.	4.3	8.1	31
19	Paper and printing etc.	13.9	23.8	68
20	Leather and leather products	58.8	74.4	26
21	Rubber, petroleum, plastic, cola	204.1	584.2	627
22	Chemicals etc.	300	505	598
23	Non-metallic products	31.9	36.7	22
24	Metals	182.7	364.2	753
25	Metal products except mach. and tpt. equipment	53.4	91.8	128
26	Tractors, agri. implements, industrial machinery, other machinery	129.5	225.6	158
27	Electrical, electronic machinery and applications	96.3	178.5	137
28	Transport equipment	76.3	177.3	137
29	Miscellaneous manufacturing industries	389.8	760.7	483
30	Construction	0	0	55
31	Electricity	0	0	277
32	Gas and water supply	0	0	8
33	Railway transport services	42.9	77	100
34	Other transport services	249.4	457.3	429
35	Storage and warehousing	0	0	3
36	Communication	0.9	2.2	51

37	Trade	298.4	492.3	561
38	Hotels and restaurants	90.4	213	139
39	Banking	13.7	146.9	388
40	Insurance	19.3	63.3	81
41	Ownership of dwellings	0	0	0
42	Education and research	0	0	0
43	Medical and health	0	0	1
44	Other services	510	1453.8	1186
45	Public administration	0	0	0
46	Tourism	230.5	357.6	127
	Total	**4110.3**	**7850.7**	**8017**

Source: IDF report (2008).

Table IV.2: Output and employment multipliers based on input–output matrix of 2003-04

S No	Sectors	Output multipliers	Employment multipliers
1	Food crops	1.64	8.56
2	Cash crops	1.38	2.15
3	Plantation crop	1.34	2.34
4	Other crops	1.31	0.40
5	Animal husbandry	1.43	0.68
6	Forestry and logging	1.19	0.97
7	Fishing	1.27	0.56
8	Coal and lignite	1.55	0.35
9	Crude petroleum, natural gas	1.25	0.09
10	Iron ore	1.55	0.26
11	Other minerals	1.35	2.04
12	Food products	2.36	1.72
13	Beverages, tobacco, etc.	2.07	0.62
14	Cotton textiles	2.30	1.40
15	Wool, silk and synthetic fibre	2.52	1.06
16	Jute, hemp, mesta textiles	2.11	1.28
17	Textiles products including wearing apparel	2.37	1.22
18	Wood, furniture etc.	1.82	3.14
19	Paper and printing etc.	2.35	0.58
20	Leather and leather products	2.40	1.11
21	Rubber, petroleum, plastic, cola	2.22	0.26
22	Chemicals etc.	2.31	0.36
23	Non-metallic products	2.14	1.01
24	Metals	2.67	0.53
25	Metal products	2.61	0.64
26	Tractors, agriculture implements,	2.53	0.60

	industrial machinery		
27	Electrical, electronic machinery and applications	2.55	0.38
28	Transport equipments	2.51	0.40
29	Miscellaneous manufacturing industries	2.63	0.65
30	Construction	2.08	0.97
31	Electricity	2.28	0.36
32	Gas and water supply	1.59	0.41
33	Railway transport services	1.94	0.49
34	Other transport services	2.07	0.67
35	Storage and warehousing	1.81	0.67
36	Communication	1.48	0.64
37	Trade	1.37	0.83
38	Hotels and restaurants	2.12	1.79
39	Banking	1.37	0.22
40	Insurance	1.53	0.28
41	Ownership of dwellings	1.15	0.36
42	Education and research	1.23	0.80
43	Medical and health	2.36	0.69
44	Other services	1.97	0.69
45	Public administration	1.00	0.64
46	Tourism	2.13	0.83

CHAPTER V: IMPACT OF TRADE ON WAGES AND EMPLOYMENT IN THE UNORGANIZED SECTOR OF INDIA

5.1 Introduction

The unorganized sector[11] has emerged as an important sector of the Indian economy. While almost the entire farm sector can be characterized as an unorganized/informal sector, approximately 80 per cent of the workforce in the non-farm sector is also employed in the unorganized sector. Not only does the unorganized sector (consisting mainly of small economic entities with less than ten workers) contribute substantially to total employment of the economy, it contributes as much as 50% of India's GDP.[12] However, in spite of its contribution to the economy, the majority of India's poor are in the unorganized sector.

It is important to mention at the outset that the manufacturing sector's exports may be derived from both the organized sector and also from unorganized small-scale manufacturing units such as handicrafts, metals, small-scale carpet-weaving units etc. However, data on direct exports from the unorganized sector are not available. Considering the fact that unorganized manufacturing is closely interlinked with the organized sector due to its backward and forward linkages,[13] the unorganized manufacturing sector may be directly, as well as indirectly, affected by trade. Therefore, for any analysis of the impact of trade on the poor, it becomes imperative to examine the impact of trade on the wages and employment of unskilled workers in the unorganized sector.

Although some studies exist on the impact of trade liberalization in India on wages and employment in the organized sector, there exists only meagre evidence to corroborate whether trade liberalization has brought about any effect on employment and wages in the unorganized manufacturing sector. Lack of research on trade-related effects on the unorganized sector is mainly due to the lack of data with respect to the trade orientation of the industry to which enterprises in the unorganized sector belong. Furthermore, data on unorganized manufacturing for India are available with a gap of five years. This makes it difficult to undertake empirical analysis based on consistent data over a long period. This chapter attempts to overcome these data

[11] In line with the international definition and the characteristics of Indian industries, the National Commission of Enterprises in Unorganized sector (NCEUS) defines the unorganized /informal sector as "*The unorganized /informal sector consists of all unincorporated private enterprises owned by individual or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis and with less than ten total workers.*"

[12] The Task Force constituted by the National Commission of Enterprises in Unorganized sector (NCEUS) in its report on the Contribution of the Unorganized sector to GDP (June 2008).

[13] The interdependence as highlighted in Mehta (1985), Samal (1990), Shaw (1990) is established through forward linkages by sale of output, subcontracting and marketing of products and through backward linkages by purchase of inputs and raw material, acquisition of skills and technology and credit. The forward linkages are said to be relatively weak compared to backward linkages, which are fairly strong.

problems and to undertake empirical analysis of the impact of trade on wages and employment in the unorganized sector in India.

Recognizing the potential of this sector to absorb the burgeoning labour force of India and to improve the incomes of the poor, the following issues are examined in detail:

- Do higher exports from industries to which the enterprises in the unorganized sector belong increase enterprises' employment and wage levels? In other words, do gains from higher exports from the organized sector percolate down to the unorganized sector, given the backward and forward linkages between the two?

- Has the growing domestic competition from imports affected the employment and wages of the workers in the unorganized sector?

- Does higher external competition due to trade improve the productivity of the enterprises in the unorganized sector?

- Do locational factors, such as the state in which the enterprise is located, influence the impact of trade on employment and wages in unorganized manufacturing? In other words, will the state's orientation to trade affect the impact of trade on labour markets in the unorganized sector?

In order to examine the above issues, this chapter estimates the impact of trade on the employment, wages and labour productivity of enterprises in the unorganized sector. The empirical analysis is undertaken for 81,000 enterprises for the year 2005-06.

Furthermore, this chapter fills an important research gap by empirically estimating the impact of exports and imports on labour markets in the unorganized manufacturing sector by taking into account variations across industries, states and location (rural-urban). A cross-section enterprise-level analysis is conducted using data for 81,000 enterprises. The impact of the export orientation of the state to which the enterprise belongs on employment, wage rates and the labour productivity of the enterprise, is estimated.

It should be noted that the impact of trade on unorganized manufacturing may not be straightforward, as the data available for this sector is at the enterprise and the industry level, and trade data is available at the product level. In other words, at the enterprise level, exports and imports are not recorded. Data at the enterprise and industry level is available from the National Industrial Classification (NIC). Trade data is available at product level, in accordance with the classification structure of the Harmonised System of Classification (HS Classification). Therefore, a concordance matrix is constructed to match six-digit HS 2002 codes to three-digit NIC codes, to arrive at trade figures at the industry and enterprise level. Using the concordance matrix, the impact of trade at the industry level on wages, employment and labour productivity has been estimated.

This chapter is organized as follows: Section 5.2 examines inter-industry trends and growth patterns in the unorganized manufacturing sector at a two digit level industrial classification. Section 5.3 discusses the empirical results of the impact of trade (exports and imports) on employment, wage rates and labour productivity in unorganized manufacturing. Section 5.4 summarizes and draws implications.

5.2 Trends in employment, wages and gross value added in the unorganized manufacturing sector

The unorganized manufacturing sector in India comprises a large number of small enterprises, often unregistered, mostly under proprietorship. The composition shows three main types of enterprises: (i) Own Account Manufacturing Enterprise (OAME-micro enterprises), which run without any hired worker employed on a fairly regular basis and are engaged in manufacturing and/or repairing activities (with family labour only); (ii) Non-directory Manufacturing Establishment (small enterprises) employing less than six workers (household and hired workers taken together) and engaged in manufacturing activities; and (iii) Directory Manufacturing Establishment (large enterprises) employing six or more workers (household and hired workers taken together), engaged in manufacturing activities.

Table 5.1 provides a summary of key variables in the unorganized manufacturing sector at all-India level and at disaggregated level for rural and urban unorganized manufacturing sector during 2000-01 and 2005-06.[14]

The table shows that during 2000-01 there were 17.02 million unorganized manufacturing enterprises (11.9 million in rural and 5.08 in urban areas) providing employment to 37.08 million people, of which nearly 23.98 million were in rural areas and 13.09 million in urban areas. During the period 2000-01 to 2005-06, there was a marginal increase in the total number of enterprises, but the number of enterprises in urban areas declined from 5.08 million to 4.94 million. Employment fell from 37.08 million to 36.44 million in this period, declining in both rural and urban areas.

Apart from rural-urban bifurcation, data at the enterprise level shows that microenterprises occupy an overwhelming share in terms of both number of enterprises and employment, particularly in rural areas. However, in the period 2000-01 to 2005-06, the share of microenterprises in total employment in the unorganized sector declined from 67.5% to 65%, while the share of small enterprises increased from 15% to 15.8% and the share of large enterprises increased from 17.4% to 19.1%. Given the five-year period, this change seems to be marginal. However, this does reflect a shift towards relatively bigger enterprises in the unorganized sector.

[14] The information has been obtained from quinquennial NSS surveys and is available for different industries and states, i.e., 56th NSS Round and 62nd NSS Round.

Wage rates in the unorganized sector have risen during this period. The wage rate increased by a compound growth rate of 7.6 % in nominal terms in the five-year period. The rise in wage rates in enterprises in rural areas (9%) was higher than that in urban areas (7.6%), probably because of the lower level of wages in the base period in rural areas.

Interestingly, the share of microenterprises in gross value added (GVA) declined from 42% in 2000-01 to 31.8% in 2005-06, while the share of large enterprises increased substantially from 32.7% to 44.1%, with the share of small enterprises being more or less the same. A rise in the share of large enterprises in GVA was seen in both rural and urban areas. This indicates the growing importance of large enterprises in contribution to total output of the unorganized sector over time.

Table 5. 1: Summary chart on key variables in unorganized manufacturing during 2000-01 and 2005-06

	2000-01			**2005-06**		
Key variables	**Rural**	**Urban**	**Combined**	**Rural**	**Urban**	**Combined**
Enterprises (million no.)	11.93	5.08	17.02	12.13 (0.32)	4.94 (-0.58)	17.07 (0.05)
Employment (million no.)	23.98	13.09	37.08	23.46 (-0.44)	12.98 (-0.17)	36.44 (-0.35)
Workers per enterprise	2.01	2.57	2.18	1.93	2.63	2.13
Percentage share of type of enterprises in all enterprises						
Micro enterprises	92.66	70.88	86.14	91.59	70.90	85.60
Small enterprises	5.27	21.26	10.05	6.14	20.74	10.37
Large enterprises	2.07	7.86	3.80	2.26	8.36	4.03
Percentage share of type of enterprises in total employment						
Micro enterprises	79.83	45.16	67.59	76.82	43.64	65.00
Small enterprises	8.06	27.71	15.00	10.16	26.15	15.86
Large enterprises	12.11	27.13	17.42	13.01	30.21	19.14
Percentage share of type of enterprises in total GVA						
Micro enterprises	63.05	25.75	42.28	49.50	18.43	31.89
Small enterprises	13.80	33.91	25.02	16.90	29.66	24.20
Large enterprises	23.10	40.34	32.70	33.60	51.85	44.15
GVA per enterprise (Rs.)	22348	65863	35357	31355 (7.01)	100267 (8.77)	51307 (7.73)

Labour productivity (Rs.)	11120	25598	16233	16211 (7.83)	38167 (8.32)	24034 (8.16)
Capital intensity (Rs.)	27600	137500	60500	38732 (7.84)	194321 (6.72)	83780 (7.16)
Loan outstanding per enterprise (Rs.)	2900	10100	5100	4634 (9.83)	31966 (25.91)	12548 (19.73)
Emoluments per hired worker – Wage rate (Rs)	13082	22133	18488	20233 (9.11)	31302 (7.18)	26682 (7.61)

Note: Figures in parentheses are compound growth rate during 2000/01 to 2005/06 at nominal prices

In rural unorganized manufacturing, the micro enterprises contribute the maximum in terms of workforce and value addition, but lag behind small enterprises and large enterprises in terms of GVA per worker, which in micro enterprises is half that in the two other types of enterprises. The micro enterprises are mostly self-employed, and are considered as the reservoir of unlimited labour supplies. They have low capital base and productivity. In addition, due to low levels of technology and capital, these small family-run enterprises are not able to compete with others, and hence are likely to become unviable.

In urban areas, small enterprises and large enterprises contribute the maximum in GVA, and together employ around 54.8 per cent of the workforce and add 74.2 per cent of value added. Further, small enterprises are growing rapidly in urban areas as compared to rural areas, which could be due to "ancillarization" of enterprises, easy subcontracting due to the greater presence of organized manufacturing, inadequate employment opportunities outside this sector, better infrastructure etc. (Kundu, Lalitha and Arora, 2001; Sharma and Dash, 2006).

Trends at the industry level reveal that the food, tobacco and textiles industries (agro-based industries) have a significantly large number of enterprises and workers in both the rural and urban manufacturing sector, but these industries lag behind others (mainly non-agro-based industries) in labour productivity and capital intensity. In addition, non-agro-based industries have experienced a relatively higher absolute increase as well as growth rate in value added per worker, capital intensity, wage rates, and institutional finance compared to agro-based industries, especially in rural areas.

It is important to note that there are no data on the extent of exports done directly by the unorganized manufacturing sector in India. However, there is evidence that over time, there has been a rise in outsourcing from firms in the organized sector to enterprises in the unorganized sector, especially in the export-oriented industries (NSSO, 2007). The study, therefore, estimates the impact of export orientation of the industries to which the enterprises belong on the employment, wages and labour productivity of the enterprises. The estimates capture both the direct as well as the indirect impact of exports on the labour market characteristics of enterprises in the unorganized sector. Unlike most of the other studies, which have used tariffs as an

explanatory variable for import competition, this study uses a more direct explanatory variable for import competition, i.e. import of goods produced by the industry to which the enterprise belongs.

5.3. Empirical results: Impact of trade on employment and wage rates in the unorganized sector

Chapter 3 reviews the studies that estimate the impact of international trade on the unorganized sector. Although there is little evidence of exports from the unorganized sector, international trade can indirectly affect employment and wage rates in the unorganized sector significantly. Higher exports from the organized sector can lead to an outsourcing of orders to the unorganized sector and can generate higher demand for informal workers and subsequently affect employment and wage rates. On the other hand, import competition can lead to contraction of output in the organized sector, leading to lower demand for output and labour from the unorganized sector.

To estimate the impact of export orientation and import competition faced by the industry on the wages and employment of enterprises in the unorganized sector, labour demand and wage rate equations have been estimated. The details of the methodology are reported in Appendix I (Section A.4). Both ordinary least squares (OLS) and simultaneous equation model (2SLS) results are presented in Annex V. Table V.2 presents the OLS estimates of the impact of trade on employment in the unorganized manufacturing sector during 2005-06. Table V.3 presents OLS results of the impact of trade on wage rates in enterprises in the unorganized sector. Table V.4 presents the results of 2SLS model, which estimates the labour demand and wage rate equation simultaneously, using the predicted wage rate in the labour demand equation.

The labour demand equation estimated explains the level of employment in an enterprise by the "size" of the enterprise, wage rate paid by the enterprise, and export and import intensity of the industry to which the enterprise belongs. The literature in the context of export markets has used firm size as a proxy for essential firm resources required to venture into the market. The bigger the size of the firm, the higher the employment will be. The export intensity of the industry is defined as the ratio of exports of the industry to its total output. Import intensity, on the other hand, is defined as imports of the final product produced by the industry as a ratio of the industry's output. Impact of trade on employment is captured by estimating the impact of competition in external market (through export intensity) and competition in domestic markets (through import intensity) on the labour demand of the enterprise.

The rural-urban dummy is used to capture the impact of urbanization, and state dummies have been used to control for state-specific effects.

In the estimated equations, wage bills are used to explain the extent of employment in the enterprise, but doubts have been raised about the data on wage rates as derived from National Sample Surveys. The recorded wages paid are the wages paid for the

month in which the sample unit is surveyed, while the number of workers reported is more or less the same as those which are regular. The wage rate derived by dividing emoluments paid to workers by the number of workers employed is therefore questionable. Accepting this caveat, we estimate the wage equation and accept the results to be indicative in terms of the direction. The equations have been estimated for small enterprises and large enterprises, as micro enterprises do not employ any hired workers, and therefore no wages are paid per se.

Table V.4 presents the results of two stage least squares (2SLS) where the labour demand equation is estimated along with the wage rate equation, and the results of 2SLS are reported for small enterprises and large enterprises.

The results show that, as expected, large enterprises employ more people and at higher wage rates. At higher wage rates, the demand for labour is less. The results show that after controlling for rural-urban differences, industry-specific variations, and the size of the firm, the higher the export intensity is of the industry to which the enterprise belongs, the higher the employment in the enterprise will be. The export orientation of the industry to which the enterprise belongs therefore increases the demand for labour. The impact of export orientation is found to be higher and more significant for large enterprises (enterprises employing six or more workers) than small enterprises (enterprises employing less than six workers). One possible reason for this could be that the organized sector is increasingly sourcing its export requirements from the unorganized sector on a contractual basis. This is supported by an overall increase of the percentage of firms in the organized sector working on a contractual basis with enterprises in the unorganized sector.[15] The number of enterprises in the unorganized sector found working on a contractual basis with firms in the organized sector increased from 27.6% during 2000/01 to 31.7 % during 2005/06. Of the total number of firms working on contract, the proportion of micro enterprises was 33%, small enterprises 25%, and large enterprises 30%.

The import competition faced by the industry, i.e. the extent to which the final product produced by the industry is imported as a proportion of its output, is found to have a significant negative impact on employment of the enterprise belonging to that industry in the unorganized sector according (Table V.3). However, 2SLS results show that import competition faced by the industry in the organized sector does not have any significant displacement effect on employment in small enterprises in the unorganized sector (Table V.4). The labour-displacing effect is found only in the case of large enterprises. This indicates that domestic competition is not adversely affecting enterprises with less than six workers, but may displace or reduce the size of the enterprises with more than six workers. We do find that there has been a decline in the number of micro enterprises in the post-reform period.

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[15] "There is an increasing trend of outsourcing by the organized sector, it has been found that 32 per cent of all unorganized sector enterprises undertake contract work" (Report by NSSO, 2007)

The empirical results further show that the larger the output of the firm and higher the labour productivity, the higher the wage rates are paid by the enterprises. With respect to the export intensity of the industry to which the enterprise in the unorganized sector belongs, it is found that the higher the export intensity of the industry is, the higher the wage rate is paid by the enterprise. This indicates that enterprises that belong to export-oriented industries pay more to their labour. This is in line with the results obtained by many studies for other developing countries (e.g. Goldberg and Pavcnik, 2007).

Import intensity, however, is not found to have any significant impact on wage rates, according to the 2SLS results. It is also found that wage rates do not differ significantly in the unorganized sector across rural and urban areas.

The results, though not comparable with other studies due to their being for the unorganized sector, are in line with Goldar (2002), who found higher employment elasticity of demand in export-oriented industries in the post-reform period, and Banga (2006), who estimated the positive impact of exports on organized employment. The findings also appear to substantiate the argument put forward by Haggblade, Hazell and Reaerdon (2007) which shows that liberalized trade and exchange rate policies generally hurt rural firms that compete with imported goods, while helping enterprises that serve export markets or use imported equipments and inputs.

Thus, the results show that the export orientation of industries increases the employment and wage rates of enterprises in the unorganized sector, but import competition displaces labour only in the larger enterprises and does not affect wage rates.

5.4 Empirical results of the impact of the trade orientation of states on wages and employment

Table V.5 presents the 2SLS results of the impact of the trade orientation of states on the employment and wages of enterprises in the unorganized sector. Model 1 presents the results for small enterprises, and model 2 presents the results for large enterprises. The employment equation takes the export intensity of the industry, import competition faced by the industry, and the export orientation of the state to which the enterprise belongs as factors affecting the employment by the enterprise, along with other factors such as the size of the enterprise (captured by output/gross value added) and wage rates.

A striking result found is that the state's export orientation has a statistically significant impact on employment in both kinds of enterprises – i.e. small enterprises and large enterprises. It signifies that the location of the enterprise in terms of the state in which it operates has a strong influence, irrespective of whether the enterprise belongs to an export-oriented industry or not. Enterprises belonging to the state with

higher export orientation have higher employment. As expected, the size of the enterprise positively affects employment, implying that the large enterprises employ more labour. Wage rates have a negative relation with employment, which is consistent with the theory. As wages rise, the cost to the enterprise goes up, and employment therefore reduces.[16]

The results are consistent with those arrived at earlier with respect to the export intensity of the industry to which the enterprise belongs. Enterprises belonging to industries that have higher export intensity have experienced a rise in employment. However, import competition is not found to have displaced jobs in large enterprises in the unorganized sector, although small enterprises or enterprises employing less than six workers are not adversely affected by the import competition. The probable reason for this is that the larger the size of the firm, the larger the probability of it outsourcing to organized-sector firms, and import competition may therefore adversely affect them more than it affects small enterprises.

The wage rate equation estimated simultaneously for small enterprises shows that the export orientation of the state leads to higher wage rates being paid by large enterprises, or larger enterprises as compared to small enterprises or smaller enterprises. Higher export intensity of the industry is found to lead to higher wage rates in both small enterprises and large enterprises in the unorganized sector, but import competition does not affect the wages in small enterprises in any significant manner. A plausible reason for this could be that the enterprises in the exporting industries are able to pay more. With respect to import competition, results show that enterprises in the industry that face higher import competition, pay lower wage rates. Banga (2006) found a similar positive impact of export intensity on wage rates in the organized manufacturing sector, but no adverse effect of import competition faced by the industry on the wage rates of skilled/unskilled workers in organized manufacturing. One plausible explanation for the diverse effects of import competition on wage rates in the two sectors could be that unlike the organized sector, where the Government has a role in determining wage rates and enacts strict labour laws, wages in the unorganized sector are more flexible due to an absence of government intervention by means of legislation or otherwise.

State orientation towards exports does not assure higher wages in small enterprises. This is in line with the economic theory which argues for unlimited supply of labour at a given wage rate in the unorganized sector. A higher demand for labour due to the export orientation of the state does not lead to higher wages. The results show that the size of the enterprises, and labour productivity, have a significant positive effect on the wage rate, in conformity with economic theory. Results also suggest that wage rates are lower in rural areas in the case of large enterprises, whereas there are no significant rural-urban differences in wage rates in small enterprises. Thus, the export

[16] The F statistics is high which show that the instrument used, which is predicted wages in this case, is suitable (see Stock and Watson, 2003, ch 10).

orientation of the state significantly influences employment as well as wage rates in the unorganized sector.

5.5 State-specific empirical results

To assess the state-specific impact on employment and wages in the unorganized sector, the impact of the export and import intensity of the industry to which the enterprise belongs is undertaken separately for each state. The results of the states where the export intensity of the industry has a significant impact on employment in the unorganized sector are reported in Annex Table V.6. The states for which the results are not reported are the states where higher export orientation does not have any significant impact on employment in the unorganized sector.

The results show that states such as Punjab, Haryana, Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu are the states where the export intensity of the industry to which the enterprise belongs has increased the employment of the enterprises in the unorganized sector. The other variables, namely size of firm and wage rate, have the expected impact. According to the Economic Survey 2007-08, these are also the states with the highest share of exports in total exports.

5.6 Conclusions and policy implications

This chapter analyses the impact of trade on labour markets in the unorganized manufacturing sector in India in the post-reform period. The analysis begins with trends and growth patterns at 2-digit level during 2000-01 and 2005-06, followed by an empirical estimation of the impact of various factors, including exports and imports, on employment, and wage rates using cross-section data for 2005-06.

The empirical findings cover 81,000 enterprises, 66 industries at three-digit level, and 35 states and union territories, to capture the labour market impacts of trade at all-India level, state level and enterprise level. The results, based on the ordinary least square method and 2SLS model, reveal both internal factors (operating within the system) and external factors (exports and imports) to be at work in labour markets, having a differential impact on wages and employment. While higher industrial exports lead to higher employment and higher wage rates in the unorganized sector for small enterprises (those employing less than six workers) and for large enterprises (those employing more than six workers), the gains in terms of employment and wages are found to be higher in the case of large enterprises as compared to small enterprises. An important conclusion that emerges from the result is that in order to harness gains from trade, the size of the enterprise matters. Large enterprises gain more. This may be due to their higher scale of production and capital intensity, which allows them to improve their labour productivity in the face of competition and consequently increase their output and employment. They are also able to pay more to their labour. Import competition, on the other hand, has overall had an unfavourable impact on the labour markets in the unorganized sector, especially in the case of large enterprises.

It may be emphasized that the unorganized manufacturing sector in the country, with its low capital base, is very large and growing. It is responsible for absorbing the growing labour force of the country, mainly from rural areas. This sector is not covered by any policy regime, but since it hosts the maximum number of the country's poor, it may have important implications with respect to the impact of trade on labour absorption and poverty reduction.

In the face of this, and due to the growing importance of this sector, the Government of India has instituted the National Commission for Enterprises in the Unorganized Sector (NCEUS), whose recommendations may be put into practice in the near future. Unlike the organized sector, where wage rigidity is an important feature, this sector has been able to work in a wage-flexible scenario. In fact, the results obtained do show that growth in real wages in unorganized manufacturing has decelerated much faster than growth in employment in the post-liberalization period, which in a way has facilitated the cost adjustments.[17] Improvements in the scale of production and in the capital investments of the enterprises in the unorganized sector can be an important policy intervention. This may help enterprises to gain from the opportunities provided by the export orientation of their industries, and to compete successfully in domestic markets.

The results also indicate that the location of the enterprise is an important determinant of whether trade impacts are percolated to the unorganized sector. States where exports have favourably affected employment in the unorganized sector are Punjab, Haryana, Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu. An important conclusion that emerges from the analysis is that interregional disparities exist with respect to the impact of trade on wages and employment. A higher export orientation of the industry to which the enterprise belongs leads to higher employment, but this may not be the case in all states. The export orientation of the state may play a vital role in distributing the gains of overall trade in the economy. Further, in order to percolate the gains of trade to the poor, backward and forward linkages between the unorganized sector and the organized sector may play an important role.

***

[17] See also Bathla and Sharma (2008).

ANNEX V

Table V.2: Impact of trade on employment in unorganized manufacturing: 2005-06 (OLS estimates)

Dependent Variable: Log No. of workers			
	All enterprises	**Small enterprises**	**Large enterprises**
Independent variables in log	Coefficient (t value)	Coefficient (t value)	Coefficient (t value)
GVA	0.464 (75.17)*	0.26 (26.49)*	0.38 (34.21) *
Wage rate	-0.246 (-31.83)*	-0.10 (-8.51)*	-0.30 (-22.90) *
Export intensity	0.0403 (2.84) *	0.055 (2.25)*	0.16 (4.22) *
Import intensity	-0.0127 (-0.92)	-0.055 (-2.71)*	-0.099 (-3.24) *
Rural-urban dummy	0.09 (15.78) *	0.008 (1.76)**	0.10 (10.08) *
Industry dummies	Yes	Yes	Yes
State dummies	Yes	Yes	Yes
Constant	-1.34 (-27.67)	-0.67 (-10.94)	-0.33 (-2.76)
R-squared	0.68	0.32	0.47
Number of observations	28461	17449	9574

Note: * indicates significance at 1%, ** indicates significance at 5%, ***indicates significance at 10%.

Table V.3: Impact of trade on wage rates in unorganized manufacturing during 2005-06 (OLS estimates)

	Small enterprises (3)	**Large enterprises (4)**
Independent variables in log	Coefficient (t value)	Coefficient (t value)
GVA	0.46 (19.49)***	0.17 (12.82)***
Labour productivity	0.35 (11.91)***	0.65 (42.31)***
Export intensity	0.07 (3.37)***	0.01 (2.42)**
Import intensity	-0.06 (-2.26)**	-0.01 (-3.68)***
Rural-urban dummy	-0.07 (-0.86)	-0.09 (-0.77)
Industry dummies	Yes	Yes
State dummies	Yes	Yes
Constant	-0.15 (-2.14)*	0.056(1.53)
R-squared	0.62	0.85
Number of observations	17449	9574

Note: * indicates significance at 1%, ** indicates significance at 5%, ***indicates significance at 10%.

Table V.4: Impact of trade on wages and employment in the unorganized sector: Simultaneous equation model results

	Small enterprises (employment equation)	**Small enterprises (wage rate equation)**	**Large enterprises (employment equation)**	**Large enterprises (wage rate equation)**
Independent variables in log	Coefficient (t value)	Coefficient (t value)	Coefficient (t value)	Coefficient (t value)
GVA	0.26*** (66.5)	0.46*** (38.72)	0.38*** (74.16)	0.17*** (15.69)
Wage rate	-0.10*** (-24.83)		-0.32*** (49.96)	
Labour Productivity		0.34*** (25.56)		0.64*** (49.96)
Export intensity	0.002*** (2.36)	0.008*** (4.31)	0.013*** (7.53)	0.02*** (9.41)
Import intensity	-0.01 (-0.89)	-0.01 (-0.04)	-0.01* (-1.71)	-0.01* (-1.63)
Rural-urban dummy	0.008* (1.74)	0.007 (0.88)	0.13*** (14.41)	0.09 (0.20)
State dummies	Yes	Yes	Yes	Yes
Constant	-0.65*** (-4.66)		0.73 (25.59)	0.42*** (10.20)
R-squared	0.33	0.65	0.42	0.85
F-Statistic	46770 (p = 0.00)	7247.82 (p=0.00)	1745.38 p= (0.00)	14669.36 (p=0.00)
Number of observations	17556	17556	9584	9584

Note: Results of 2SLS are reported.

Table V.5: Impact of the state orientation towards exports on the wages and employment in the unorganized sector: Simultaneous equation model results

	Model 1		**Model 2**	
	Small enterprises (employment equation)	**Small enterprises (wage rate equation)**	**Large enterprises (employment equation)**	**Large enterprises (wage rate equation)**
Independent variables in log	Coefficient (t value)	Coefficient (t value)	Coefficient (t value)	Coefficient (t value)
GVA	0.25*** (65.76)	0.46*** (38.75)	0.38*** (74.07)	0.18*** (15.97)
Wage rate	-0.10 (-25.37)		-0.31*** (-48.91)	
Labour productivity		0.34*** (35.37)		0.65*** (48.91)
Export intensity	0.001** (1.80)	0.007*** (3.37)	0.03*** (11.30)	0.01*** (2.35)
Import intensity	0.001 (1.48)	-0.0002 (-0.12)	-0.02*** (-8.49)	-0.01*** (-3.85)
State export orientation	0.009*** (6.70)	-0.01 (-0.80)	0.005** (1.83)	0.02*** (5.78)
Rural-urban dummy	0.15*** (3.11)	-0.01 (-1.42)	0.13*** (14.08)	0.09*** (6.85)
Constant	-0.49*** (-19.23)	-0.16*** (-3.43)	0.65*** (21.41)	0.49*** (11.19)
R-squared	0.46	0.72	0.42	0.86
F statistics	1049.67 (p=0.00)	4850.67 (p=0.00)	1176.5 (p=0.00)	9797.1 (p=0.00)
Number of observations	17431	17431	9546	9546

Table V.6 State-wise regression results with employment as the dependent variable (continued)

	Punjab		Haryana		Gujarat	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Variables						
Constant	-1.29***	-13.94	-1.32***	-13.42	-0.99***	-9.44
GVA	0.36***	14.43	0.51***	18.94	0.67***	21.24
Wage rate	-0.11***	-3.73	-0.29***	-8.85	-0.5***	-13.66
Export intensity of the industry	0.01**	2.24	0.01**	2.03	0.04***	5.39
R-squared	0.60		0.68		0.57	
Number of observations	1181		1103		1190	

	Maharashtra		Andhra Pradesh		Karnataka		Tamil Nadu	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Variables								
Constant	-0.77***	-15.44	-2.02***	-19.66	-1.37***	-10.03	-1.48***	-18.93
GVA	0.4***	18.1	0.46***	21.03	0.48***	12.57	0.61***	39.98
Wage rate	-0.23***	-8.57	-0.16***	-7.51	-0.28***	-6.96	-0.39***	-20.81
Export intensity of the industry	0.009***	2.91	0.02***	3.15	0.02***	3.63	0.003**	1.99
R-squared	0.60		0.58		0.60		0.67	
Number of variables	2606		1811		962		2781	

CHAPTER VI: IMPACT OF TRADE ON THE AGRICULTURAL WAGES OF UNSKILLED LABOUR IN INDIA

6.1 Introduction

Agriculture is the largest sector in India in terms of its contribution to employment. It continues to remain the mainstay for a large majority of the population, with about 600 million people depending directly or indirectly on this sector. Therefore, agricultural policy in India has been guided mainly by domestic supply and self-sufficiency considerations. Incentives and subsidies are provided in this sector through support prices to farmers, and through supplies to the general population at low cost through the public distribution system.[18]

Given the significance of this sector for employment, this sector still has a variety of control measures, such as high tariffs, state trading, export and import restrictions etc.[19] Some of the controls are imposed or relaxed in times of shortages, overproduction or price fluctuations; this is not infrequent, as the repeated decisions to reduce tariffs on wheat to zero indicate. Thus, many of the policies related to trade in agriculture are still adopted in an ad hoc manner.

However, agriculture exports and imports have been rising steadily, and the sector's exposure to trade has been increasing over the years. In the period 2000-01 to 2004-05, exports of agriculture and allied activities increased at a compound growth rate of 9% and imports of food and allied products increased by 24% (Economic Survey 2007-08). Given the rising exposure of the sector to trade and the high dependency of the economy with respect to employment, mainly of the poor, it becomes imperative to estimate the impact of trade on wages and employment in this sector in order to assess the overall impact of trade on the unorganized sector. However, the unavailability of consistent employment data for the sector makes any analysis of the impact of trade on agriculture employment difficult. The availability of wage data of unskilled labour at the state level makes it possible to undertake impact assessments of trade on wages in agriculture sector.

The impact of trade on wages of unskilled agricultural labour is estimated at the state level for total agricultural products and separately for three agricultural product categories, namely cereals; fruits and nuts; and vegetables, roots and tubers. The period of analysis is 1990-91 to 1999-2000, for which data on wages to unskilled agricultural workers are available. Section 6.2 discusses the trends in agriculture wages in India across different states, section 6.3 presents the empirical results, and section 6.4 summarizes and concludes.

[18] India Trade Policy Review 1998
[19] Economic Survey 2008-09 (pp 164-169)

6.2. Trends in agriculture wages in India

Agricultural Wages in India (AWI) is the oldest series of wage data available in the country. This provides data for various agricultural operations, and is collected by the Directorate of Economics and Statistics, Ministry of Agriculture. In spite of its limitations as an indicator of wages for rural labour, it remains the major source for wage data, used by researchers as well as the government for policy formulations and analysis regarding the standard of living of rural labourers.

Table 6.1 presents the real wage rates and their growth, for different states. The figures suggest a high growth rate of 6.12% for 1983 to 1987-88 at all-India level. In this period, most of the states show improved performance in increasing wage rates for agricultural labourers, with Haryana and Rajasthan being exceptions to the general trend. Using triennium averages, even the traditionally lagging states show good performance, with real wages growing at the rate of 6–7 per cent for Orissa, Assam, Bihar, Karnataka, Madhya Pradesh, Maharashtra, and Uttar Pradesh. West Bengal is the best performer, showing the highest growth rate of around 10% for the same period.

For the period 1987-88 to 1993-94, which also includes the period of fiscal crisis and the subsequent economic reforms, growth in wage rates shows a deceleration in almost all states and at all-India level where the growth rate dropped to around 2% from around 6% compared to previous period. The decline in the growth of wage rates is sharper for Andhra Pradesh, Assam, Bihar, Gujarat and Karnataka. In Uttar Pradesh and West Bengal, there is a sharp decline compared to the previous period.

For the period 1993-94 to 1999-00, most of the states continue to show a lower growth rate compared to the 1983 to 1987-88 period. However, at the all-India level, wage rate growth improved to 2.3%, compared to 2% in the previous period. Nevertheless, this increase was mostly accounted for by the increased growth performance of states, such as Kerala and Tami Nadu, which grew at a rate of higher than 7%. Even at the all-India level, the growth rate during 1993-94 and 1999-00 was lower than the entire period between 1983 and 1993-94.

Table 6. 1: Agriculture wage rates state-wise: 1983 to 1999-2000

Real Wage Rates from Agricultural Wages in India (1999-00 prices)									
	Triennium Averages				Growth Rates				
	1983	1987-88	1993-94	1999-00	1983-87-88	1987-88-93-94	1993-94-99-00	1983-93-94	1987-88-99-00
Andhra Pradesh	28.36	38.47	40.31	45.27	7.01	0.78	1.95	3.40	1.36
Assam	37.75	51.07	52.20	51.83	6.95	0.37	-0.12	3.14	0.12
Bihar	28.11	37.74	40.71	43.15	6.77	1.27	0.98	3.59	1.12
Gujarat	33.40	40.23	40.10	56.97	4.22	-0.05	6.02	1.76	2.94
Haryana	63.75	68.82	79.99	74.13	1.71	2.54	-1.26	2.19	0.62
Karnataka	24.30	30.77	31.70	41.48	5.38	0.50	4.58	2.56	2.52
Kerala	58.96	66.06	77.29	121.1	2.56	2.65	7.77	2.61	5.18
Madhya Pradesh	23.91	31.17	37.35	41.85	6.07	3.06	1.91	4.34	2.48
Maharashtra	22.85	30.87	36.83	42.83	6.92	2.98	2.55	4.65	2.77
Orissa	20.63	28.33	35.89	36.81	7.31	4.02	0.42	5.42	2.20
Punjab	56.78	67.77	83.00	76.91	4.01	3.43	-1.26	3.68	1.06
Rajasthan	47.46	47.86	46.33	56.19	0.19	-0.54	3.27	-0.23	1.35
Tamilnadu	26.06	29.79	37.13	57.10	3.02	3.74	7.43	3.43	5.57
Uttar Pradesh	33.05	42.20	47.36	56.09	5.58	1.94	2.86	3.48	2.40
West Bengal	32.98	50.29	60.14	65.36	9.82	3.03	1.40	5.89	2.21
All India	30.58	39.94	44.86	51.44	6.12	1.95	2.31	3.72	2.13
	Annual Figures				Growth Rates				
	1983	1987-88	1993-94	1999-00	1983-87-88	1987-88-93-94	1993-94-99-00	1983-93-94	1987-88-99-00
Andhra Pradesh	31.21	38.82	42.77	45.96	4.97	1.63	1.21	3.05	1.42
Assam	39.45	52.23	49.96	51.68	6.44	-0.74	0.57	2.27	-0.09
Bihar	28.79	37.35	41.58	41.36	5.96	1.80	-0.09	3.56	0.85
Gujarat	36.50	36.18	41.88	62.06	-0.20	2.47	6.78	1.32	4.60
Haryana	68.41	67.25	81.90	73.03	-0.38	3.34	-1.89	1.73	0.69
Karnataka	25.50	29.59	37.53	43.33	3.36	4.04	2.43	3.75	3.23
Kerala	56.53	67.98	78.15	110.6	4.18	2.35	5.96	3.13	4.14
Madhya Pradesh	27.01	31.46	37.89	42.99	3.44	3.15	2.13	3.27	2.64
Maharashtra	26.10	29.82	42.70	38.85	3.01	6.16	-1.56	4.80	2.23
Orissa	21.41	27.94	37.09	36.83	6.10	4.83	-0.12	5.37	2.33
Punjab	58.77	69.88	84.98	75.77	3.92	3.31	-1.89	3.57	0.68
Rajasthan	49.18	56.69	43.36	58.57	3.21	-4.37	5.14	-1.19	0.27
Tamilnadu	24.84	29.00	41.46	63.68	3.51	6.14	7.42	5.00	6.77
Uttar Pradesh	34.83	41.04	46.28	54.02	3.71	2.02	2.61	2.74	2.32
West Bengal	32.39	54.13	61.59	64.94	12.09	2.17	0.89	6.31	1.53
All India	31.96	40.02	47.03	50.92	5.13	2.73	1.33	3.75	2.03

6.3 Empirical results: Impact of trade on the wages of unskilled labour in the agriculture sector

The impact of exports and imports of agricultural products on the wages of unskilled labour has been estimated. The details of the methodology adopted and the data sources

are reported in Appendix I (section A.5). Annex Tables VI.1 and VI.2 report the change in real wage rates for the period 1993-94 to 1999-2000, and minimum agricultural wages for the selected states. Table VI.3 presents the empirical results for all agricultural products taken together and for three different agricultural products, i.e. fruits and nuts; cereals; and vegetables, roots and tubers. The estimation uses data for 14 states of India (for which comparable data were available) for the period 1991-92 to 2000-2001.

6.3.1. Results for all agricultural products

With respect to agricultural products as a whole, empirical results show that exports have not had any significant impact on the wages of unskilled labour. In other words, states with higher export orientation with respect to agriculture do not have correspondingly higher wages for unskilled workers; however, wage rates of labour in unskilled agriculture are associated negatively with imports of agricultural products. This implies that higher imports of agriculture products have adversely affected the wages of unskilled labour in states where the production of the corresponding product has a high share in India's total production of the product. Furthermore, the results show that states that use better technology, in terms of more fertilizers, and have larger irrigated areas, pay more to their unskilled agricultural labour.

It is interesting to note that states that have higher minimum wage legislation for the agriculture sector pay higher wages to unskilled labour. This indicates that social security nets may be desirable, and effective in improving the share of unskilled labour in total income generated.

6.3.2 Fruits and nuts

The results may differ with respect to different agricultural products. With respect to fruits and nuts, the results show that exports have increased the wages of unskilled labour, but it is statistically significant only at a low level. The result is therefore only indicative in nature. However, the results also show that higher imports of fruits and nuts have led to a decline in the wages of unskilled labour in agriculture. This indicates that the growing imports of fruits and nuts may have lowered domestic production of those fruits and nuts, thereby lowering the demand for unskilled labour and adversely affecting their wages. The size of the state is found to affect the wages paid to the unskilled workers. It is found that larger states with larger gross irrigated areas pay higher wages.

6.3.3 Cereals

In case of cereals, the results indicate that exports of cereals have led to a significant rise in the wages of unskilled workers, and imports have not had any significant impact. This is plausible, as during the period of analysis, imports of cereals were limited. Other variables that positively affect the wages of unskilled labour in the production of cereals are better rainfall, higher gross irrigated area, and greater use of fertilizers.

6.3.4 Vegetables

For vegetables, the results indicate that imports of vegetables have led to a fall in the wages of unskilled labour but the impact of exports is not significant. Imports displace domestic production, leading to lower demand for labour and lower wages. The number of tractors used in a state reflects its technological advancement. The results show that states that use better technology compared to others pay more to their unskilled labour.

Overall, only in the case of cereals have exports led to a favourable impact on the wages of unskilled labour. For all agricultural products, and at disaggregated level for fruits and nuts and vegetables, exports have had no impact on the wages of unskilled labour; but imports have had significant adverse impact on the wages of unskilled labour. Results also indicate that the wages of unskilled labour are positively affected if state domestic product is higher, rainfall is higher, and the minimum wages of unskilled labour are fixed at a higher level.

6.4. Conclusions and policy implications

The chapter examines the impact of trade on the wages of unskilled labour in the agriculture sector. Results show that the poor may be affected differentially in different sectors by trade and within the sector; the impact will depend on many other factors, such as the product they produce, and the state in which they are employed.

The results indicate that for states that produce a higher proportion of the agricultural products that are exported, there is no evidence of a corresponding rise in wages for unskilled labour. However, states that produce a higher proportion of agricultural products that are imported have witnessed lower wage levels for unskilled labour.

The importance of existing regulations in protecting the wages and employment of unskilled labour in agriculture is highlighted by the results. The results indicate that the minimum wages of unskilled labour at the state level has led to relatively higher wages of unskilled agriculture labour in the states. The existence of downward rigidity of wages due to minimum wage regulations and their enforcement is required to mitigate the adverse impact that imports may have on wages.

ANNEX VI

Table VI.1 Change in real wages for unskilled agricultural workers for selected states

Annual Percentage Change in Real Wages for Unskilled Agricultural Labour for Selected States

State	Percentage Change for agricultural year (July to June) over previous year						
	1993-94	1994-95	1995-96	1996-97	1997-98(P)	1998-99(P)	1999-2000(P)
Andhra Pradesh	(+) 8.60	(+) 2.71	(-) 1.73	(+) 1.51	(+) 4.33	(-) 3.46	(+) 4.13
Assam	(-) 6.58	(-) 1.67	(+) 2.68	(+) 1.52	(+) 0.77	(+) 1.18	(-) 1.02
Bihar	(+) 5.98	(+) 1.69	(-) 2.30	(+) 15.15	(-) 4.70	(-) 5.70	(-) 3.26
Gujarat	(+) 2.86	(+) 1.27	(+) 2.92	(+) 5.08	(+) 14.43	(+) 7.37	(+) 10.14
Karnataka	(+) 41.31	(-) 15.60	(-) 8.61	(+) 21.39	(+) 17.05	(-) 2.83	(+) 8.42
Kerala	(-) 2.84	(+) 5.24	(+) 13.20	(+) 14.54	(+) 15.67	(+) 4.90	(-) 14.53
Madhya Pradesh	(-) 3.53	(+) 4.93	(+) 1.24	(+) 1.31	(+) 0.83	(+) 0.79	(+) 3.74
Maharashtra	(+) 25.58	(-) 0.68	(-) 7.89	(+) 8.31	(+) 8.78	(-) 5.41	(-) 10.84
Orissa	(-) 0.14	(-) 3.52	(+) 0.55	(-) 0.41	(+) 2.39	(+) 0.61	(-) 0.23
Punjab	(+) 1.51	(-) 1.17	(-) 6.50	(-) 0.42	(+) 0.56	(-) 2.92	(-) 0.74
Rajasthan	(-) 7.66	(+) 1.05	(+) 10.33	(+) 17.81	(+) 5.12	(-) 16.26	(+) 16.83
Tamil Nadu	(+) 11.60	(+) 1.03	(+) 3.63	(+) 7.90	(+) 13.39	(+) 2.63	(+) 16.84
Uttar Pradesh	(-) 6.77	(-) 2.31	(+) 14.78	(-) 6.39	(+) 17.36	(+) 0.38	(-) 5.61
West Bengal	(-) 6.50	(-) 5. 29	(-) 0.28	(+) 11.15	(+) 3.02	(-) 3.14	(+) 0.65
All India	**(+) 5.61**	**(-) 0.39**	**(+) 0.72**	**(+) 6.37**	**(+) 7.17**	**(-) 1.56**	**(+) 1.15**

(P) : Provisional.

Notes: (I) Data on state average wage rates for unskilled agricultural labour in current prices are taken from the Ministry of Agriculture. The same have been converted into real wages by deflating with the State level Consumer Price Index Numbers for Agricultural Labourers (CPIAL) with 1960-61 as base. (CPIAL) has been sourced from Labour Bureau, Shimla). Having estimated real wages for agricultural year percentage change over previous year has been worked out.

(II) New series of CPIAL with base 1986-87 = 100 were released w.e.f. November 1995. To maintain continuity of old series of CPIAL, the new series have been converted by using the linking factor of each state and then, the average for each state has been worked out on the basis of converted series.

(III) The real wages for unskilled agricultural labour for each state have been weighted by total agricultural labourers of the state for working out all India average. The weighted average real wages for all India are based on 14 states as reported above. Having estimated weighted average real wages for all India, percentage change over previous year has been worked out.

Source: Ministries of Agriculture and Labour.

Table VI.2: State-wise agricultural minimum wages

State-wise Daily Rates of Minimum Wages for Agricultural Workers fixed under Minimum Wages Act, 1948@ (As on 1.10.2001, 30.06.2003, 31.12.2004 and 31.03.2006)				
	Minimum Wages for unskilled Agricultural Workers (in Rs. per day)			
States/UTs	As on 1.10.2001	As on 30.06.2003	As on 31.12.2004	As on 31.03.2006
Andhra Pradesh	Rs. 52.00 to Rs. 55.50 p.d. (According to Zones)	Rs. 52.00 to Rs. 55.50 p.d. (According to Zones)	52.00#	64.00 to 84.00 (as per zone)
Arunachal Pradesh	Rs. 39.87 to Rs. 42.11 p.d. (According to Areas)	Rs. 39.87 to Rs. 42.11 p.d. (According to Areas)	39.87# (Area-I) 42.11 (Area-I) (According to zones)	55.00 (Area-I) 57.00 (Area- II)
Assam	Rs. 45.00 p.d. * without food, Shelter and clothing Rs. 38.60 p.d. plus food, shelter and clothing	Rs. 60.00 p.d. without food, Shelter and clothing Rs.50.00 p.d. plus food, shelter and clothing	50.00 with food, Shelter and clothing 60.00 without food, Shelter and clothing	69
Bihar	Rs. 37.88 p.d. *	Rs. 37.88 p.d. *	50	66
Chhatisgarh	-	52.87	52.87	52.87
Goa	Rs. 58.00 p.d.	58#	94.00#	94
Gujarat	Rs. 75.80 p.d.	50	50	50
Haryana	Rs. 74.61 p.d. *	Rs. 79.31 with Meal	84.29 with Meal 88.29 Without Meal	84.29 with meal 88.29 without meal
Himachal Pradesh	Rs. 51.00 p.d.	83.31without Meal#	65.00#	70
Jammu and Kashmir	Rs. 45.80 p.d.	45.00#	45.00#	66
Jharkhand	-	45	-$	-
Karnataka	Rs. 51.63 p.d.	56.3	56.3	56.48
Kerala	Rs. 30.00 p.d. for light work Rs. 40.20 p.d. for Hard work	Rs. 100.00 p.d. for light work Rs. 150 for Hard work	100.00 for light work 150.00 for Hard work#	72.00 for Lighting Work 125.00 for Hard work
Madhya Pradesh	Rs. 51.80 p.d. *	54.56	56.96	56.96
Maharashtra	Not Available	Not Available	Zone-I 51.00 Zone-II 49.00 Zone-III 47.00 Zone-IV 45.00	Zone-I 51.00 Zone- II 49.00 Zone- III 47.00 Zone- IV

				45.00
Manipur	Rs. 62.15 p.d.* for Valley Areas Rs. 65.15 p.d. for Hill Areas	66	66	72.4
Meghalaya	Rs. 50.00 p.d. *	50.00#	70	70
Mizoram	Rs. 70.00 p.d.	84.00#	84.00#	91
Nagaland	Rs. 45.00 p.d.	50.00#	50.00#	66
Orissa	Rs. 42.50 p.d. *	52.5	52.5	55
Punjab	Rs. 72.38 p.d.* with Meal Rs. 82.08 without meal	82.65	87.59	90.58
Rajasthan	Rs. 60.00 p.d.	60	673.00#	73
Sikkim	The Minimum Wages Act, 1948 yet to be extended.	The Minimum Wages Act, 1948 yet to be extended.	The Minimum Wages Act, 1948 has been extended w.e.f.1.10.2004	-
Tamil Nadu	Rs. 54.00 p.d.	54	54.00#	70.00-80.00
Tripura	Rs. 45.00 p.d.	50#	50.00#	50
Uttar Pradesh	Rs. 58.00 p.d.*	58	58	58
Uttaranchal	-	58	58	73
West Bengal	Rs. 58.90 p.d.* (with Meal) Rs. 62.10 (without meal)	Rs.108.57with Meal Rs. 111.77 (without meal)	107.99 with Meal 110.97 without meal	62 with meal 65 without meal
Andaman and Nicobar Islands	Rs. 70.00 p.d. (Andaman) Rs. 75.00 (Nicobar)	Rs.100.00 p.d. (Andaman) Rs. 107.00 (Nicobar)	100.00# (Andaman) 107.00# (Nicobar)	100.00 (Andaman) 107 (Nicobar)
Chandigarh	Rs. 81.65 p.d.	100	100	114
Dadra and Nagar Haveli	Rs. 60.00 p.d.*	60	84	89
Daman and Diu$	-	-	-	-
Delhi	Rs. 99.70 p.d.*	50 to 60#	110.1	125.8
Lakshadweep	Rs. 46.80 p.d.*	107.1	-$	-
Pondicherry		52		-
Pondicherry Region	Rs. 20.00 to Rs. 22.00 p.d.	Rs. 45.00 to Rs. 119.00	45.00 to 100.00	45.00 for 5 hours (women)
Mahe Region	Rs. 30.00 p.d. for light work Rs. 40.20 p.d. for Hard work	Rs. 30.00 for light work Rs. 40.20 for Hard work	30.00 for light work 40.20 for Hard work	-
Yanam Region	Rs. 19.25 to Rs. 26.25 p.d.	Rs. 19.25 to Rs. 26.25	55.00 to 75.00	55.00 for 5 hours (women) 65.00 for 6 hours (Men)
Karaikal	Rs. 20.00 to Rs. 22.00 p.d.	Rs. 45.00 to Rs. 100.00	45.00 to 100.00	54.00 for 6hours (Men)

Central Sphere	Rs. 83.02 to* Rs. 92.71 p.d.	Rs. 90.05 to Rs.100.48	94.04 to 104.89	102.78 to 114.78

Note : The minimum wages also include the variable dearness allowance, wherever provided.

* : Indicate the Provision of variable dearness allowance with the minimum rates of wage.

: No Provision of variable dearness allowance with the State.

$: Not applicable.

@ : The minimum wages also include the variable dearness allowance, wherever provided.

Source: Ministry of Labour and Ministry of Agriculture, Govt. of India.

Table VI.3: Impact of trade on the wages of unskilled workers in agriculture in India: 1991-92 to 2000-2001

Dependent variables: Log real wages of unskilled labour in agriculture

Explanatory variables	Fruits and nuts coefficient (t value) (1)	Cereals (2)	Vegetables, roots and tubers (3)	Oilseeds (4)	All agricultural products (5)
Lag	-0.26 (-00.4)	0.51** (2.07)	1.13*** (4.91)	0.65*** (5.05)	0.64 (3.00)
Log exports	0.30 (1.53)	0.05*** (2.43)	-0.004 (-0.24)	-0.004 (-0.10)	-0.03 (-0.70)
Log imports	-0.25* (-1.83)	0.01 (1.58)	-0.009*** (-2.62)	-0.0008 (-0.02)	-0.11*** (-2.44)
Log state domestic product	0.80*** (2.91)	-0.07 (-0.73)	0.25 (1.20)	0.27** (2.36)	0.52*** (2.92)
Log rainfall	0.64*** (2.46)	0.13* (1.85)	-0.04 (-0.50)	0.03 (0.40)	0.001 (0.03)
Log share of agriculture	-0.97* (-1.57)	-0.20 (-1.12)	-0.20 (-1.10)	-0.06 (-0.36)	-0.16 (-0.69)
Log gross irrigated area	-0.4*** (-2.16)	0.28* (1.92)	0.28 (1.05)	-0.03 (-0.24)	0.34* (1.76)
Log number of tractors	0.92 (1.64)	-0.05 (-1.60)	0.08* (1.81)	0.01 (0.26)	-0.01 (-0.32)
Log fertilizers	0.06 (1.30)	-0.13** (-2.23)	-0.29*** (-2.49)	-0.13 (-1.66)	-0.23*** (-2.42)
Log minimum wages	-0.06 (-0.85)	-0.05 (-0.93)	-0.04 (-0.85)	-0.05 (-1.20)	0.06*** 3.06)
Constant	0.21 (1.1.3)	0.39 (0.45)	-1.56 (-0.82)	_	-1.31* (-1.78)
Number of observations	83	92	88	84	89
Sargan test Chi2	9.19	5.31	5.96	6.67	5.0
Auto correlation (z)	1.03	0.98	0.86	1.02	0.32

Note: *** indicates significance at 1%, ** indicates significance at 5%, * indicates significance at 10%.
The figures reported are the coefficients and the figures in bracket are the t-values.
The estimations are carried out for 14 States for the period 1991-92 to 2000-2001.

CHAPTER VII: HAVE UNSKILLED LABOUR IN ORGANIZED MANUFACTURING BENEFITED FROM INTERNATIONAL TRADE?

7.1 Introduction

One of the key arguments for promoting international trade in developing countries is the favourable impact of trade on employment and returns to unskilled labour. This argument finds its origin in standard trade theories, e.g. the Heckscher-Ohlin theorem and Stolper-Samuelson theorem, according to which trade results in a country exporting more of the product, which uses its relatively abundant factor increasing the relative returns to this factor. As unskilled labour is the relatively abundant factor in developing countries, it has been hypothesized that trade will favourably affect unskilled labour by increasing demand for it and consequently its returns. However, as discussed in chapter 3, the assumptions upon which these theorems are built are not sufficient to mirror the complexities of the real world in low-income countries, particularly due to the existence of unlimited supply of unskilled labour, disguised unemployment, and restrictive trade regimes.

In the context of India, the debate on whether trade benefits unskilled labour in terms of enhanced employment and returns has an additional dimension. In particular, one of the unique characteristics of Indian labour markets is their dualistic nature, where a large unorganized sector co-exists with the organized sector. There are many regulations in India that apply only to the "organized sector".[20] Some of these regulations lead to rigidities in labour markets, which may interfere with the straightforward application of trade theories. These include fairly stringent rules relating to the firing of workers and the closing down of enterprises, along with requirements for reasonable compensation for retrenchment; laws governing the use of temporary or casual labour which enforce permanence of contract after a specified time of employment; and minimum wage legislation, which raises the cost of hiring workers and leads to downward inflexibility in wages.

Further, it has been argued by some that given a large unorganized sector, which contributes around one third of manufacturing output and employs 86% of total workers,[21] the arguments for trade increasing gains for labour are at best not relevant for organized industries, which employ only a small percentage of the total labour force.

However, inflexibilities in the Indian labour markets may lead to differential impacts from trade on labour markets as compared to other countries, but the existence of a large

[20] The "organized sector" in India is defined by the size of establishment in terms of number of workers (more than 10 workers).
[21] See National Commission of Enterprises in the Unorganized sector (2008)

unorganized sector by itself may not render the argument concerning impact of trade on unskilled labour in the organized sector irrelevant for the economy. Gains/losses from trade may directly accrue to labour in the organized sector, and given high backward and forward linkages,[22] they may percolate down through the organized sector to the unorganized sector. According to the Economic Survey (2007-08), most of the increase in organized-sector employment in the period 1999-00 to 2004-05 was on account of increases in the employment of informal workers from the unorganized sector. Therefore, although the organized sector may be a small part of the whole economy, it is the most dynamic sector with respect to distributing the gains/losses of trade.

Given the complexities of the Indian labour market and the interlinkages between the organized sector and the unorganized sector, it becomes important to estimate the extent to which trade has affected unskilled labour, both in the unorganized sector and the organized sector. To this end, this chapter estimates the impact of trade on the wages and employment of unskilled labour in the organized manufacturing sector at three-digit industry level for the period 1998-99 to 2005-06.[23] The differential impact of trade on labour productivity and wage inequality on skilled and unskilled labour is estimated too.

The next section discusses trends in wages and employment in the organized manufacturing sector. Section 7.3 presents the empirical results and section 7.4 concludes the chapter.

7.2. Trends in organized manufacturing labour markets in India

7.2.1 Trends in employment in organized labour markets

The most informative statistics available on unemployment are the daily status of unemployment provided by NSSO.[24] Using this data and tracing the employment trends in India, it is found that employment almost doubled in 2004-05 as compared to 1983-84, and the growth rate of employment was much higher in the period 1999-2000 to 2004-05 as compared to 1993-94 to 1999-2000, when it actually fell below the 1983-84 to 1993-94 level (Table 7.1).

The table shows that the unemployment rate has increased from about 20.27 million in 1993-94 to about 34.74 million in 2004-05. This was because the labour force grew at a rate of 2.84%, which was higher than the 2.62% increase in the workforce. Unemployment rates are over two percentage points higher than ten years ago (at 6.07 % in 1993-94 compared to 8.28% in 2004-05), and the employment-to-population ratio is lower than it was ten years ago. While a part of the reason for the decline in this ratio

[22] Mehta (1985), Samal (1990), Shaw (1990) establish strong backward and forward linkages between the two sectors.

[23] The choice of the period has been restricted as ASI changed the industrial classification in 1998-99.

[24] NSSO gives the average level of unemployment on a given day, during the survey year and thereby capture the unemployed days of the chronically unemployed; the unemployed days of usually employed who become intermittently unemployed during the reference week and unemployed days of those classified as employed according to the criterion of current weekly status.

could be extended time spent on education, it is also indicative of low employment opportunities.

Table 7. 1: Employment and unemployment rates in India

	1983-84	1993-94	1999-00	2004-05	1983 to 1993-94	1993-94 to 1999-00	1999-00 to 2004-05
	million				Growth p.a. (%)		
Population	718.10	893.68	1005.05	1092.83	2.11	1.98	1.69
Labour force	263.82	334.20	364.88	419.65	2.28	1.47	2.84
Workforce	239.49	313.93	338.19	384.91	2.61	1.25	2.62
Unemployment rate (per cent)	9.22	6.06	7.31	8.28			
Number of unemployed	24.34	20.27	26.68	34.74			

Source: Economic Survey 2007-08.

This decline in the growth of employment during 1993-94 to 1999-00 can also be attributed to lower absorption in agriculture. The share of agriculture in total employment dropped from 61% to 57% during this period. It further fell to 52% in 2004-05. While the share of the manufacturing sector increased only marginally during this period, the trade, hotel and restaurant sector contributed significantly to overall employment (Table 7.2).

Table 7. 2: Employment in India by sector:

Industry	**1983**	**1993-94**	**1999-00**	**2004-05**
Agriculture	65.42	61.03	56.64	52.06
Mining and quarrying	0.66	0.78	0.67	0.63
Manufacturing	11.27	11.10	12.13	12.90
Electricity, water etc.	0.34	0.41	0.34	0.35
Construction	2.56	3.63	4.44	5.57
Trade, hotel and restaurant	6.98	8.26	11.20	12.62
Transport, storage and communication	2.88	3.22	4.06	4.61
Fin., insur., real est., and busi. services	0.78	1.08	1.36	2.00
Comty., social and personal services	9.10	10.50	9.16	9.24
Total	**100.0**	**100.0**	**100.0**	**100.0**

Source: Economic Survey 2007-08

According to the National Commission for Enterprises in the Unorganized Sector (NCEUS), organized sector employment increased from 54.12 million in 1999-00 to 62.57 million in 2004-05. However, the increase was accounted for by the increase in informal workers in organized enterprises, from 20.46 million in 1999-00 to 29.14 million in 2004-05. Thus, the increase in employment in the organized sector has been because of informal employment of workers.

7.2.2. Trends in wages in the organized manufacturing sector

The most reliable source for wages paid in the organized manufacturing sector is the Annual Survey of Industries, which gives, at three-digit level, detailed data on the wages paid to workers, supervisory staff and other employees. If the definition of unskilled labour is taken as 'blue collar' workers and skilled labour as 'white collar' workers in the organized manufacturing sector, then a rising trend in the wage rates of both skilled and unskilled workers is observed, although the rise has been much higher for skilled workers than for unskilled workers.

7.3. Empirical results: Impact of trade on the wages and employment of unskilled labour in organized manufacturing

To estimate the impact of trade on the wages and employment of skilled and unskilled workers in the organized sector, similar equations are estimated as in the case of the unorganized sector. As the impact is analysed for a longer period of time, i.e. 1997-98 to 2005-06 for 54 three-digit level industries, the Generalized Method of Moments (GMM-IV) one-step estimators, following Arellano and Bond (1991),[25] have been adopted. The details of the methodology are reported in Appendix I (Section A.6).

7.3.1 Impact of trade on the wages of unskilled labour

To estimate the impact of exports and imports on the wages of unskilled labour (blue collar workers, or 'workers' by the ASI definition), inter-industry analysis for 54 industries for the period 1997-98 to 2005-06 is undertaken.

The impacts of exports and imports on the wages and employment of unskilled labour[26] are presented in Annex Table VII.1. The results with respect to the impact of trade on the wages of unskilled workers show that after controlling for inter-industry differences, the export intensity of the industry has a positive and significant impact on the wages of unskilled workers. This implies that if other factors remain the same, the higher the exports of an industry relative to its output, the higher the wages paid by the industry will be. However, the impact of import intensity, which reflects imports of the products produced by the industry as a proportion of its total output, is not found to have a statistically significant impact. This indicates that import competition does not have any significant impact on the wages of unskilled workers in the organized sector. A plausible

[25] The coefficients and standard errors reported are those of the one-step estimation since, as Arellano and Bond (1991) argue, inference based on standard errors obtained from the two-step estimates can be unreliable. The Sargan test of over identifying restrictions and the test for second order autocorrelation are, however, based on two-step estimates (see Arellano and Bond 1991).

[26] The dependent variables are Log of wages of unskilled workers and Log of number of unskilled workers. All estimates are based upon heteroscedastic robust standard errors. Consistency of the GMM estimates requires that there is no second order correlation of the residuals of the first-differenced equation. Our results of the AR(2) test on the residuals as developed by Arellano and Bond (1991) do not allow us to reject the hypothesis of the validity of instruments used. We also use industry dummies at two-digit level to control for industry-specific effects.

explanation for imports not affecting wages could be the downward rigidity in wage rates, given the minimum wage norms applicable in the organized manufacturing sector. The export orientation of the industry, on the other hand, will create pressure on the industry to retain labour and to improve their skills, which may raise their returns. As expected, the other factors, such as output of the industry, and labour productivity, positively contribute to the wages of unskilled labour. The methodology controls for differences in the technology used by the industry. While low-tech industries may pay higher wages to unskilled workers, this is not found to be the case in Indian manufacturing.

7.3.2 Impact on employment of unskilled labour

In terms of employment, the results are not very encouraging, as the results do not show that the export orientation of industries positively impacts the employment of unskilled labour. This result appears to be contrary to the results arrived at by other studies such as those of Banga (2005) and Goldar (2002), who find a higher employment elasticity of demand in export-oriented industries in the post-reform period. However, since the impact was analysed on the employment of unskilled labour and not on total labour, the results may not be comparable. One of the plausible reasons for this result could be strict labour laws, which, as argued by many, discourage firms from employing more labour. The employment of informal workers has been increasing over the years in organized manufacturing (Economic Survey 2007-08), which is also indicative of the fact that export-oriented industries may be outsourcing more or employing more informal labour, which is not captured by the data used.

The results further reveal that import competition does not have any significant impact on the employment of unskilled labour. This is not very surprising, given the strict labour firing policy in India. The size of the firm, as expected, has a positive impact on the numbers of unskilled labour employed, and wage rates have a negative impact.

7.3.3 Impact of trade on labour productivity

Annex Table VII.2 presents the results of the dynamic panel-data estimation of labour productivity equations. Estimates are done for aggregate employment and for skilled and unskilled labour separately. Skilled labour implies 'white collar workers', while unskilled labour implies 'blue collar workers'. Equation (1) of Table VII.2 presents the results for labour productivity of total labour force, irrespective of the skills of labour. Equation (2) presents results with respect to skilled labour, and equation (3) presents results with respect to unskilled labour. Each of the equations has been estimated separately to capture the impact of export intensity and import intensity.

For aggregate labour, impacts of both export intensity and import intensity are found to be positive and statistically significant. This implies that both export intensity and import intensity of the industries lead to higher labour productivity of labour. This supports the view that competition, whether in the international market or the domestic market, will raise labour productivity.

Trade may differently affect the productivity of skilled and unskilled labour. The results show that export intensity of the industry increased labour productivity of unskilled labour. This is in line with the trade theory as it is expected that developing countries such as India will export products that are labour-intensive and produced mainly in low-tech industries which employ more unskilled labour.

Import intensity, on the other hand, is found to have improved labour productivity of both skilled and unskilled labour. Domestic competition may therefore raise productivity levels of labour more than competition in international markets. Higher capital intensity is found to improve labour productivity of both skilled and unskilled labour. However, the impact in the case of skilled labour is much larger than that in the case of unskilled labour. Modernization of industry, reflected in terms of rise in capital labour ratio, increases the productivity of skilled labour more than that of unskilled labour.

The results control for the size of the industries. The larger the size of the industry is, the higher the productivity is of both skilled and unskilled labour.

7.3.4 Impact of trade on wage inequality

Annex Table VII.3 presents the results of the dynamic panel-data estimation of impact of trade on wage inequality between skilled and unskilled labour. Two specifications have been tested; one controls for technology differences across industries using the K/L ratio, while the other equation is estimated by dropping the K/L ratio. The results are reported in equations (1) to (4) of the table.

Wage inequality is defined as the difference between the wage rate of skilled and unskilled labour. The higher the wage inequality is, the lower the wage rate is of unskilled labour as compared to skilled labour.

Keeping other factors constant, the results indicate a positive relationship between the export and import intensities of the industry with wage inequality. This indicates that increase in competition, whether external or domestic, increases the wage differential between skilled and unskilled worker in an industry. This is in line with other studies, including Bhagwati and Dehejia (1994). Buoyancy in economic activities, as witnessed in the period until 2006, fast augmented the demand for skilled labour. However, as industries became more labour-intensive, the demand for unskilled labour did not increase in the same proportion. It is interesting to note that the lagged wage inequality has a significant positive relationship with wage inequality in the current period, which indicates that industries with higher wage differentials in the past have continued to have larger wage inequalities in the subsequent period as well.

The fact that the increase in trade in India is positively related with the widening wage inequality is also reinforced by the direct relationship between scale of output and wage inequality across the sectors. Increase in output of the industry is found to be directly related to increase in the inequality in the wage rate. The results also show that in India's

manufacturing sector, as the proportion of unskilled labour to skilled labour rises in an industry, the wage inequality between skilled and unskilled labour lowers. This indicates that in industries that employ more unskilled labour as a proportion of skilled labour, the wage inequality between skilled and unskilled labour is lower. High-tech industries are found to have a larger wage inequality, which is along the lines expected, as they would hire more expensive skilled labour. The impact of exports and imports on wage inequality is also tested by not controlling for technology; when this is the case, it is found that similar results are arrived at, which indicates the robustness of the results.

7.4. Conclusions

This chapter examines the linkages between international trade and labour market outcomes in India. Theory predicts that with greater openness to trade and the resulting expansion of trade, developing countries' labour-intensive manufacturing sector will benefit in terms of improvements in employment and returns to unskilled labour. It has also been argued that the abundant factor (unskilled labour) should benefit more from trade. This might result in a reduction in the wage differential between unskilled and skilled labour. To test these propositions, the chapter examines the impact of trade on the employment and wages of unskilled labour in India in the organized manufacturing sector. It further estimates the impact of trade on the productivity of skilled and unskilled labour and their wage inequality.

The analysis is conducted using data drawn for 54 industries at three-digit level for the period 1998-99 to 2004-05. Focusing on the registered manufacturing sector, it is found that the exports intensity of the industry increases the returns of unskilled labour, although the impact on employment is not found to be statistically significant. Import competition, on the other hand, is found to have no impact on wages or the employment of unskilled labour. The labour productivity of unskilled labour is found to be positively impacted by higher competition, whether in external or domestic markets. However, the productivity of skilled labour is found to have been positively affected only by domestic competition, i.e. by higher levels of imports of the products produced by the industry. Although trade has benefited labour in general and unskilled labour in particular, it has in no way reduced the differences in the wage earnings between the two classes of labour. In fact, trade has led to higher wage inequality. This suggests that higher skills enable higher gains from trade.

ANNEX VII

Table VII.1: Impact of trade on the wages and employment of unskilled workers in the Indian manufacturing sector: 1997-98 to 2005-06

Explanatory Variables	**Dependent Variable: Log Wages of Unskilled Labour** (1)	**Dependent Variable: Log number of Unskilled Labour** (2)
Log Wages to Unskilled Workers Lagged (L1)	-0.13*** (-7.19)	
Log Number of Unskilled Workers Lagged (L1)	-	-0.02** (-14.99)
Log Wage Rate (Predicted)	-	-0.01* (-0.74)
Log Output	0.32*** (8.14)	0.04* (1.97)
Log Labour Productivity of Unskilled Labour	0.02* (1.77)	
Log TECH	0.01 (1.32)	
Log Export Intensity	**0.03*** (2.43)**	**0.01 (1.39)**
Log Import Intensity	-0.01 (-0.34)	-0.02 (-1.53)
Cons	7.31*** (17.06)	4.64*** (4.42)
Industry Dummies	Yes	Yes
Wald chi2(6)	355.4*	821.3*
Auto correlation(z)	-1.20	0.91
N	302	302

Notes:
*** indicates significance at 1%, ** indicates significance at 5%, * indicates significance at 10%.
The predicted wage rate values arrived at from the wage equation are used as an instrument for wage rate in the employment equation.
The estimations are carried out for 54 industries for the period 1998-98 to 2005-06.
The figures reported are the coefficients and the figures in bracket are the t-values.

Table: VII.2 Impact of trade on the labour productivity of skilled and unskilled labour

	(1)		(2)		(3)	
Variables / Stats	**Skilled + Unskilled**		**Skilled**		**Unskilled**	
Constant	-6.7899 (-43.64)*	-6.7067 (-28.35)*	-2.7560 (-13.65)*	-2.6673 (-11.15)*	-6.8530 (-43.11)*	-6.8389 (-30.63)*
Log (LPTY)-1	-0.2593 (-4.52)*	-0.3108 (-3.70)*	0.2335 (1.78)	0.03512 (0.24)	-0.2686 (-4.84)*	-0.3576 (-4.29)*
Log (GVA)	0.5030 (25.98)*	0.4830 (22.01)*	0.3512 (13.32)*	0.3398 (11.32)*	0.5271 (23.34)*	0.5051 (21.31)*
Log (exports/output)	0.0138 (2.32)*	-	-0.0011 (-0.13)	-	0.0121 (2.08)*	-
Log (imports/output)	-	0.0258 (3.26)*	-	0.0192 (1.77)*	-	0.0224 (2.96)*
log (K/l)	0.03495 (2.84)*	0.0399 (3.22)*	0.0661 (4.32)*	0.0514 (3.26)*	0.0269 (2.32)*	0.0340 (2.91)*
Wald Chi Sq	1373.2	623.1	187.2	204.4	1411.4	648.5

Notes: (a) Estimations are made using the Arellano-Bond dynamic panel-data technique. (b) * signifies statistical significance at 5% level. (c) Due to the high degree of correlation between K/L and $(K/L)^2$, $(K/L)^2$ was dropped from the estimation.

Table VII.3 Impact of trade on wage inequality

Variables / Stats	(1)	(2)	(3)	(4)
Constant	-4.289 (-7.04)*	-5.0263 (-7.75)*	-5.0967 (-10.03)*	-5.4317 (-9.15)*
Log (Wd)	0.3503 (20.39)*	0.3877 (22.42)*	0.2988 (22.06)*	0.3456 (30.21)*
Log (GVA)	0.1101 (1.41)	0.2281 (3.48)*	0.1295 (1.88)	0.2111 (3.40)*
Log (unsk/Sk)	-0.2193 (-2.22)*	-0.2831 (-2.19)*	-0.3873 (-4.54)*	-0.4070 (-3.77)*
Log (exports-output)	0.0254 (3.55)*	0.0317 (4.06)*	-	-
Log (imports-output)	-	-	0.0178 (2.32)*	0.0369 (5.15)*
log (K/l)	0.0853 (4.02)*	-	0.0994 (5.61)*	-
Wald Chi Sq	3460.7	2087.0	2616.0	2708.5

Notes: (a) Estimations are made using the Arellano-Bond dynamic panel-data technique. (b) * signifies statistical significance at 5% level.

CHAPTER VIII: HAS TRADE ENHANCED GENDER EMPLOYMENT IN INDIA?

8.1 Introduction

Theoretical literature points out that trade may not have a gender-neutral impact. With the change in the production structure of India as a consequence of trade liberalization, new avenues of employment may favour one gender as compared to the other. Increased exports may lead to higher employment of women, but only if the intensity of women's employment is high in export-oriented units. Similarly, a rise in imports may adversely affect the employment of women if the imports are mainly in those sectors where women have a higher probability of employment.

The issue of a differential impact of trade on gender becomes even more relevant in the case of developing countries, where women are at a disadvantage in terms of access to resources starting as soon as they are born. In India, the percentage share of the female population in the total population is around 48%, while the work participation rate of females is only 26%. The male-female gap in the literacy rate is 21.59%. In 2004-05, women within the "15 years and above" age group were usually engaged in domestic duties; only 33% in rural India and 27% in urban India had reported availability for "work". In the organized sector, only 18.7% of total employees are women. This clearly indicates a gender lag whereby women start with lower levels of access to and participation in economically gainful activities.

In addition to gender differentiation in respect of access to resources, the returns from economic activities also differ significantly with respect to gender. According to the NSSO Report (2005-06),[27] the average wage rate for regular wage/salaried women employees is only 67% of that of male employees in urban areas, while it is only 55% in rural areas. Trade may affect gender returns favourably as well as unfavourably. The gender wage gap may be reduced because trade can increase competition among firms resulting in pressure to cut costs. Lower wages for women who have comparable skills to men may result in an increase in demand for their labour, ultimately leading to wage equality. However, trade often results in a premium on skills. Thus, the resulting increase in the wage gap between skilled and unskilled workers may increase the gender wage gap, given that, in most countries, men as compared to women have higher levels of labour market skills on average.

Trade, therefore, may have vital implications for gender equality, and gender-sensitized trade policy needs to be used to enhance the gender-neutral impact of trade. In order to arrive at directions for trade policy, it becomes important to identify and estimate the trade–gender impacts in an economy. However, limited literature exists that estimates gender-differentiated impacts of trade. Therefore, this chapter undertakes the following analyses:

[27] Employment and Unemployment Situation in India, NSS, 62nd round.

- **Gender employment multipliers** are estimated across 46 subsectors in the economy using the input-output tables. This helps in identifying the subsectors across agriculture, industry and services where the employment of women is relatively high.

- **Impact of exports and imports on employment of women** in the organized manufacturing sector is estimated through a labour demand equation for 54 industries over the 1999-2000 and 2004-2005 periods.

- Finally, g**ender-sensitive products,** defined as products for which the share of women's employment is relatively higher, are identified. Trade policymakers can use the list of these products as a tool to enhance gains from trade to women, by enhancing exports of these products and protecting women's vulnerabilities from trade by limiting import surges of these products.

The chapter is organized as follows: section 8.2 discusses briefly the trends in trade-related gender development indicators; section 8.3 presents the gender employment multipliers for 46 subsectors of the Indian economy; section 8.4 presents the results of the impact of trade on gender employment in the organized manufacturing sector; section 8.5 identifies gender-sensitive products for India; and section 8.6 summarizes and concludes.

8.2 Trends in trade-related gender development indicators

8.2.1 Trends in the Gender Development Index

Trends in the Gender Development Index (GDI) – which is based on life expectancy, education (the adult literacy rate and the combined primary to tertiary gross enrolment ratio), and estimated earned income – indicates that there has been some improvement in gender-related development in India (Table 8.1).

Table 8. 1: Trends in the Human Development Index and Gender Development Index in India

Year	HDI	GDI
1980	0.427	
1985	0.453	
1990	0.489	
1995	0.551	0.424
1999		0.595
2000	0.556	
2003		0.574
2005	0.596	0.590
2006	0.604	0.591
2007	0.612	0.594

Source: HDR (2009).

The United Nations Human Development Report (2009) reported India's Human Development Index (HDI) in 2007 as 0.612, which had increased from 0.556 in 2000. In terms of the HDI, India ranks 134th out of 182 countries in the world. In terms of the Gender Development Index, India ranks 134th out of 182 countries. This shows an almost zero count in terms of HDI-GDI rank, indicating that both move together. During the period from 1995 to 2003, GDI grew by 0.15 percentage points, while in 2003-07 it saw an increase of 0.02 percentage points.

8.2.2 Gender literacy rates in India

Despite a significant increase in female literacy over time, a huge gap exists between male and female literacy rates (Table 8.2). There has been no discernible attitudinal change, and education for males is still considered more essential than education for females, as there is less return on investment made in educating a girl child.

Table 8. 2: Percentage of literacy rates by sex in India

Year	Age Group	Persons	Males	Females	Rural	Urban	Male-Female Gap in Literacy Rates
1971	5 and above	34.45	45.95	21.97	27.89	60.22	23.98
1981	7 and above	43.56 (41.42)	56.36 (53.45)	29.75 (28.46)	36.09	67.34	26.65
1991	7 and above	52.21	63.86	39.42	44.69	73.09	24.84
2001	-	64.8	75.3	53.7	-	-	21.59

Source: Department of Secondary and Higher Education, Ministry of Human Resource Development, Government of India.

By 2001, around 75% of males and 50% of females were able to read and write simple sentences. However, there is a marked difference in rural and urban literacy rates. The 1991 census revealed that while literacy levels in urban areas were around 75%, those in rural areas were only 45%. The male–female gap in the literacy rate has declined since 1981, but the decline has not been too significant.

8.2.3 Trends in gender employment in India

The percentage share of female population in the total population in India is around 48%, while the work participation rate of females is only 26%, compared to 52% for males. A wide urban–rural divide exists in the participation of women and men in the economy. About 24.9% of women in rural areas and about 14.8% of women in urban areas were in the workforce in India during 2004-05, whereas about 54.6% of men in rural areas and 56.6% of men in urban areas were in the workforce. In the organized sector, out of the total employees in 2004, about 18.7% were women (Table 8.3).

Table 8. 3: Employment by industry: percentage of employment according to usual status

	1993-94	1999-2000	2004-05
Agriculture			
Rural males	74.1	53.4	66.5
Rural females	86.2	85.4	83.3
Urban males	9	6.6	6.1
Urban females	24.7	17.7	18.1
Manufacturing			
Rural males	7	7.3	7.9
Rural females	7	7.6	8.4
Urban males	23.5	22.4	23.5
Urban females	24.1	24	28.3
Construction			
Rural males	3.2	4.5	6.8
Rural females	0.9	1.1	1.5
Urban males	6.9	8.7	9.2
Urban females	4.1	4.8	3.8
Trade, hotels and restaurants			
Rural males	5.5	6.8	8.3
Rural females	2.1	2	2.5
Urban males	21.9	29.4	28
Urban females	10	16.9	12.2
Transport, storage and communications			
Rural males	2.2	3.2	3.9
Rural females	0.1	0.1	2
Urban males	9.7	10.4	10.7
Urban females	1.3	1.8	1.4
Other services			
Rural males	7	6.1	5.9
Rural females	3.4	3.7	3.9
Urban males	26.4	21	20.8
Urban females	35	34.2	35.9

Source: National Sample Survey, 62nd round.

Within services, the share of different services sectors in total female employment in services is computed. It is found that the percentage of female employment in total employment in the services sector, comprising other transport services, communications, banking, insurance, tourism and other services, is around 16%. The share of other services in total female employment in the services sector is found to be the highest

(79%), followed by communication services (11%) and banking services (5%). Female employment in the labour force is found to be low in other transport services, insurance services and tourism.

8.2.4 Trends in gender wage/salary

To assess the extent of the benefits of trade being shared between the two genders in India, it is important to examine the extent of participation by females in different sectors and gains in terms of wages and salaries.

With respect to wages and salaries, studies indicate large gender disparities. Very limited information exists for wage/salary across gender for disaggregated sectors. NSSO (2005) estimates average wage/salary received per day by regular employees for two broad categories of services (Table 8.4).

Table 8. 4: Average wage/salary (in Rs) received per day by regular wage/salaried employees of age 15-59 years by industry of work, sex, sector, and broad educational level for India.

Industry division	Not literate		Literate upto middle		Rural Educational level Secondary & Hr Secondary		Graduate and above		All	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
1	2	3	4	5	6	7	8	9	10	11
Agriculture (01--05)	45.65	53.39	54.41	66.27	134.61	149.40	105.32	200.33	54.51	71.16
Mining and Quarrying (10-14)	84.88	174.13	212.29	217.64	83.29	323.41	0.00	341.46	82.75	246.93
Manufacturing (15 -22)	26.53	58.36	36.26	74.41	47.26	103.40	89.21	160.67	38.24	90.60
Manufacturing (23 -37)	38.40	75.73	58.54	84.51	62.12	109.43	219.58	534.81	57.95	146.72
Electricity Gas & Water(40-41)	168.63	142.41	178.57	202.95	290.91	260.51	111.91	306.55	253.95	246.32
Construction (45)	82.64	85.59	44.21	100.19	101.70	111.08	136.09	223.09	90.80	106.79
Trade (50-55)	34.72	65.35	40.70	66.67	67.51	86.57	136.45	108.34	51.15	75.34
Transport and Storage etc.(60-64)	87.75	98.28	102.54	112.79	105.32	138.45	256.22	235.17	135.75	126.96
Services (65-74)	100.00	51.82	97.35	126.43	89.95	193.12	157.28	278.29	143.72	200.71
Services(75 -93)	34.70	101.07	50.55	133.20	105.74	197.20	174.18	256.93	113.66	203.66
Private hhs with emp. Persons(95)	29.18	50.74	34.10	66.68	54.90	88.14	0.00	137.67	31.27	67.80
Others (99)	NA	0.00	NA	0.00	NA	0.00	NA	250.00	NA	250.00
All	35.74	72.47	47.75	98.59	100.19	158.04	172.70	270.02	85.53	144.93
Urban										
Industry Division	Not Literate		Literate upto Middle		Educational level Secondary & Hr Secondary		Graduate and above		All	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
Agriculture (01--05)	55.60	68.83	73.45	70.66	74.20	182.06	225.56	237.37	79.59	104.80
Mining and Quarrying (10-14)	154.15	266.71	75.78	248.61	714.29	348.64	351.30	806.61	186.30	359.41
Manufacturing (15 -22)	34.23	79.41	53.25	88.45	70.71	122.10	235.10	218.85	65.58	113.22
Manufacturing (23 -37)	54.81	106.70	45.81	108.62	113.24	176.79	219.39	362.06	102.16	189.41
Electricity Gas & Water(40-41)	127.06	169.10	103.33	188.21	240.48	325.56	422.72	523.53	233.34	340.51
Construction (45)	69.08	81.03	122.35	115.36	147.59	106.45	253.59	376.45	191.75	171.47
Trade (50-55)	48.81	62.44	53.63	76.41	95.07	112.21	204.85	208.97	104.53	103.47
Transport and Storage etc.(60-64)	90.72	104.74	144.69	138.84	228.99	211.92	414.48	361.17	278.41	207.57
Services (65-74)	45.77	64.01	108.36	122.25	131.04	174.19	372.60	501.69	304.07	360.15
Services(75 -93)	78.53	126.80	116.16	150.01	186.33	239.72	247.12	345.63	205.35	265.72
Private hhs with emp. Persons(95)	38.20	78.77	42.77	89.82	51.67	62.95	67.61	164.08	41.26	86.94
Others (99)	0.00	0.00	0.00	0.00	66.71	134.00	0.00	0.00	66.71	134.00
All	48.7	89.79	64.79	111.44	150.41	182.58	269.17	366.76	153.19	203.28

Source : National Sample Survey Organisation, 61st round (July 2004 - June 2005)

Note : Code in brackets represent National Industrial Classification (NIC), 1998 industry codes.

Very interesting insights emerge from this information. In urban areas, on average, the wage/salary paid to females is only 75% of that paid to males, while in rural areas it is only 59% of that paid to males (according to 61st round of NSSO). This wage disparity differs across sectors and education levels. In urban areas, the highest gender–wage disparity exists in the mining, quarrying, and manufacturing sectors. In rural areas, the gender–wage disparity is higher in many sectors as compared to urban areas. Better access to resources such as education, technology and knowledge may be a reason for the rural–urban differences in the trends. These trends clearly reflect the existence of gender–wage disparity in all sectors of the economy.

Across services sectors, the wage/salary trends show that as the literacy levels of females increase, the wage disparity declines. However, it is interesting to note that even at graduate level and above, the salaries earned by females, on average, are only 70-75% of those earned by males with a similar level of education. This implies that with higher growth of services, even if employment opportunities for women grow at the same rate, the benefits of the growth go more to males than to females.

8.3 Gender employment generated by exports in India during the 2003/04 to 2006/07 period

The methodology to estimate the employment generated for men and women by exports is reported in Appendix I (section A.7). Table 8.5 presents the increase in male and female employment across 46 subsectors due to rises in exports during the period 2003/04 to 2006/07.

The results show that exports in the period 2003-04 to 2006-07 generated 9.38 million jobs for women and 16.6 million jobs for men**.** This implies that although exports generated additional employment for women in India in this period, it was only 36% of the total additional employment generated. However, the share of females in additional employment generated due to exports exceeds the share of females in total employment by nearly 5 percentage points. This suggests that exports may have led to a reduction of the male–female gap in employment in India.

It is interesting to note that the female employment generated is found to be high in the agriculture sector – mainly in food crops, plantation crops and cash crops. In the manufacturing sector, the female employment generated is found to be high in cotton textiles, textile products, wood furniture, and miscellaneous manufacturing products. Among the services sectors, female employment generated is found to be high in domestic trade, hotels and restaurants, other transport services and tourism. Animal husbandry is the only subsector where female employment is found to be higher than that of males.

Overall, it can be concluded that a rise in exports in the period 2003-04 to 2006-07 increased female employment in almost all sectors, although the employment generated for females was only 36% of the total employment generated.

Table 8. 5: Gender employment generated by increases in exports from 2003-04 to 2006-07

Sectors	**Increase in female employment from 2003-04 to 2006-07 (in person-years)**	**Increase in male employment from 2003-04 to 2006-07 (in person-years)**
	Numbers (millions)	**Numbers (millions)**
Food crops	1.27	1.96
Cash crops	0.67	0.98
Plantation crops	0.22	0.25
Other crops	0.11	0.16
Animal husbandry	0.12	0.07
Forestry and logging	0.09	0.11
Fishing	0.01	0.02

Coal and lignite	0.06	0.11
Crude petroleum, natural gas	0.03	0.05
Iron ore	0.02	0.02
Other minerals	0.13	0.70
Food products	0.18	0.27
Beverages, tobacco, etc.	0.00	0.00
Cotton textiles	0.21	0.34
Wool, silk and synthetic fibres	0.10	0.16
Jute, hemp, mesta textiles	0.02	0.04
Textiles products, including wearing apparel	0.36	0.54
Wood, furniture etc.	0.29	0.53
Paper and printing etc.	0.04	0.07
Leather and leather products	0.05	0.09
Rubber, petroleum, plastic, cola.	0.07	0.11
Chemicals etc.	0.08	0.14
Non-metallic products	0.03	0.07
Metals	0.18	0.41
Metal products except machinery and transport equipment	0.09	0.20
Tractors, agricultural implements, industrial machinery, other machinery	0.11	0.23
Electrical, electronic machinery and applications	0.01	0.01
Transport equipment	0.02	0.04
Miscellaneous manufacturing industries	0.38	0.80
Construction	0.09	0.18
Electricity	0.08	0.13
Gas and water supply	0.01	0.01
Railway transport services	0.10	0.18

Other transport services	0.55	1.13
Storage and warehousing	0.00	0.01
Communication	0.09	0.16
Trade	1.30	2.76
Hotels and restaurants	0.36	0.57
Banking	0.14	0.23
Insurance	0.03	0.06
Ownership of dwellings	0.00	0.00
Education and research	0.00	0.00
Medical and health	0.00	0.00
Other services	1.53	2.42
Public administration	0.00	0.00
Tourism	0.16	0.27
Total	**9.38**	**16.60**

8.4 Empirical findings of impact of trade on gender employment in organized manufacturing

In order to estimate the impact of trade on gender employment, two specifications have been estimated, i.e. the impact of the export and import intensity of industries on the proportion of women's employment in total employment; and the impact of the export and import intensities of industries on total employment in the industries. The results of the two specifications are reported in Annex VIII (Table VIII.1 and Table VIII.2).

The results reported in Table VIII.1 show that the export intensity of an industry has a positive and significant impact on women's employment, implying that the higher the exports to output ratio of an industry is, the higher the ratio of women in total employment in the industry will be. However, import intensity is not found to have any statistically significant impact on women's employment. On the contrary, the results for total employment (Table VIII.2) show that although export intensity has positively affected employment in the industry, higher import intensity is negatively related to a fall in employment intensity. In other words, as expected, the wage rate is negatively related to women's employment and total employment. These results indicate that the higher the exports of an industry are as a proportion of its total output, the higher women's employment in the industry is as a proportion of total employment. Import competition, however, does not affect gender employment.

Interestingly, the results show that technology is positively related to the women's employment ratio, while it is negatively related to total employment. This indicates that low-tech industries have higher total employment compared to high-tech industries, but that in the case of women's employment, the better the technology, the higher the proportion of women's employment is.

Further, we find that when the real wage rate rises, the fall in women's employment will be higher than the fall in men's employment. In other words, at a given wage rate, the chance of women getting employment is lower than that of men. At the aggregate level, the wage and employment relationship is inconclusive, due to a lack of statistical significance. This indicates that the wage rate may be important for determining the employment of women, but at aggregate level, it does not have a very strong relationship with employment. The weak relationship between the wage rate and employment at aggregate level could be attributable to the rigid labour laws in India.

The positive relationship between technology and the intensity of women's employment in both export and import equations indicates that as capital intensity improves, women have higher chances of employment than men do. Women may find themselves less preferred for jobs in relatively labour-intensive sectors, but they are preferred to men in relatively capital-intensive sectors. Improvements in technology reduce the need for physical strength, and enable women to opt for jobs which earlier may have been done by men. This is evident from the fact that electric machinery has seen an increase in the female share of its regular salaried workforce, from 4.6 per cent in 1983 to 19.5 per cent in 2004 (Menon, 2007).

With rapid increases in modernization of business, one would expect the intensity of women's employment to increase. The positive relationship between intensity of women's employment and technology is reinforced by the result at aggregate level. The latter shows that improvement in technology would have an adverse effect on employment, though this relationship is not strongly conclusive. Thus, improvement in technology might reduce overall employment, but would increase the proportion of women in total employment. The scale of operation of the industry is found to have a negative relationship with proportion of women's employment in total employment. In other words, the bigger the industry is in terms of its output, the less the intensity of women's employment is.

Although trade – particularly the export intensity of an industry – may have a favourable impact on women's employment, it is important to identify the industries that employ a higher proportion of women in order to gender-sensitize trade policy.

8.5. Identifying gender-sensitive products

Trade policies are generally not cognizant of the gender effects of trade. For trade gains to be fairly distributed among genders, it is important to gender-sensitize trade policies. Trade policies should attempt to address the gender vulnerabilities of the economy, such as the high dependency of women on employment in a few sectors. This section attempts to identify industries that have a high share of women in employment, i.e. gender-sensitive industries. Products from these industries are categorized as ***"gender-sensitive products".***

In order to identify gender-sensitive products, three steps are undertaken. Firstly, the extent of women's employment in three-digit-level manufacturing industries in the

organized sector is estimated. The data source for this is the Annual Survey of Industries (2005-06). Secondly, the concordance matrix constructed between six-digit HS (Harmonized System of Tariffs 2002) codes and three-digit NIC (National Industrial Classification) codes has been used. Finally, industries where women's employment is greater than three times the total industrial average over the period (2003-2005) are identified, and the products produced by these industries are categorized as *gender-sensitive products.*

With regard to Indian manufacturing, it was found that women's employment as a proportion of total employment has remained stable over the years. In fact, it was at around 15% in 2000-01 and declined to around 14% in 2004-05. Over the years, on average, it can be said that organized manufacturing industries employed around 13% of women employees (Table 8.6).

Table 8. 6 Average employment of women in India's organized manufacturing industries

Year	Ratio of women employed in total employment (average across industries in organized manufacturing)
1999-2000	0.143
2000-01	0.148
2001-02	0.135
2002-03	0.130
2003-04	0.133
2004-05	0.138
Average over the years	0.138

Source: Annual Survey of Industries 2005/06.

Averaging over the last two years, it was found that there were basically four industries that had a rate of women's employment greater than 39%, namely (a) manufacture of tobacco products; (b) manufacturing of wearing apparel except fur apparel; (c) manufacture of other food products; and (d) agricultural and animal husbandry service activities, except veterinary (Table 8.7).

Table 8.7: Industries with a high proportion of women's employment

NIC codes	Description	Ratio of women's employment to total employment
160	Manufacture of tobacco products	0.64
181	Manufacture of wearing apparel, except fur apparel.	0.59

154	Manufacture of other food products	0.39
014	Agricultural and animal husbandry service activities, except veterinary	0.39

Source: Annual Survey of Industries, 2005-06

There are 1,379 products at eight-digit level, which are produced by these industries and can be categorized as **gender-sensitive products**. Examining the gender-sensitive products, i.e. the products produced by the identified industries, it is found that these products have a high share in India's export basket. For example, manufacture of wearing apparel is an export-oriented sector where the concentration of women is not only high but has been increasing over the years. In the case of wearing apparel, for instance, the female share of its regular salaried workforce went up from 16.1% per cent to 23.1 per cent between 1983 and 2004 (Menon, 2007).

8.6 Conclusions and policy directions

Some broad conclusions and policy directions that may be inferred from the results are as follows:

The results of the chapter show that with respect to India, trade has provided more employment opportunities to women in export-oriented industries. The higher level of participation by women in industries, which are expanding because of exports, indicates that export-oriented policies can be instrumental in gender empowerment in the case of India. Trade policies can therefore be designed to provide special incentives to export-oriented units that favour higher women's employment. For example, a threshold can be decided for the share of women in total employment, above which incentives for women's employment can be provided.

The results also highlight that women's education and skill accumulation are the most important factors determining the impact of trade on women's employment and the gender wage gap. As long as women remain less qualified than men, they are likely to remain in lower-paying, less secure jobs, even if better-paying jobs become available through trade expansion. Education and skills also provide greater flexibility and power to negotiate wages and better working conditions.

It can, therefore, be said that the process of globalization is no longer an enclave process, which may influence only those that participate in trade. The impact of globalization reaches all sectors and sections of society, irrespective of their level of participation in the process. This has led to the need to formulate trade policies to incorporate the concerns of all who are affected. Gender is an area that has remained out of the orbit of trade policy formulation in many countries, especially developing countries. One of the major challenges faced by trade policymakers is to ensure gender equity in the distribution of gains from trade.

For this purpose, the following specific policy directions can be highlighted:

(a) It is important to assess the impact of trade on gender employment and wages in different sectors;
(b) Identify the sectors where gender inequality is high, which would imply that any growth of trade in the sector will further increase gender inequality; and
(c) Identify the sectors that provide potential for improving gender equality, and then formulate sector-specific policies.

***

ANNEX VIII

Table VIII.1: Dependent variable is ln (Women / Total Employment)
N=199

Independent variables	Coefficients	
	Equation (1)	**Equation (2)**
Lag L(1)	0.131 (1.76)	0.125 (1.66)
Ln GVA	-0.083 (-1.59)	-0.098 (-1.89)
Ln(W/P)	-0.510* (-2.07)	-0.534* (-2.27)
Ln (K/L)	0.050* (2.24)	0.050* (2.17)
Ln(export/output)	0.018* (3.21)	-
Ln (imports/output)	-	0.003 (0.70)
Constant	1.051 (1.17)	1.147 (1.33)

Note: (a) * indicates statistical significance at 5% level; (b) T-values in parentheses; (c) Equation (1) and Equation (2) are with export and imports as independent variables respectively.

Table VIII.2: Dependent variable is ln (Total Employment)

Independent variables	Coefficients	
	Equation (1)	**Equation (2)**
Lag L(1)	-1.56* (-4.26)	-1.54* (-4.08)
Ln GVA	-0.001 (-0.02)	0.032 (0.49)
Ln(W/P)	-0.030 (-0.12)	-0.311 (-1.14)
Ln (K/L)	-0.044 (-1.66)	-0.046 (-1.69)
Ln(export/output)		0.026* (2.28)
Ln (imports/output)	-0.040* (-3.61)	
Constant	28.83* (5.85)	30.01* (5.89)

Note: (a) * indicates statistical significance at 5% level; (b) T-values in parentheses; (c) Equation (1) and Equation (2) are with export and imports as independent variables respectively.

CHAPTER IX: CONCLUSIONS AND KEY MESSAGES

9.1 Introduction

Trade is becoming increasingly important for the Indian economy, with the trade-to-GDP ratio increasing from 16% in 1990 to 51% in 2008. When more than half of the output produced in a country is traded, especially in a country where around 37% of the population is below the poverty line, it becomes imperative to analyse how the poor of the country are affected by international trade.

There is a growing debate, albeit inconclusive, on the impact of trade on poverty. This debate has mainly focused on the "net" impact of trade on poverty and has highlighted whether trade has led to a fall or a rise in poverty. Irrespective of the methodology followed, this approach compares the 'gains' to the 'losses' to arrive at the net impact of trade on poverty. However, gains may accrue to the relatively rich while losses may accrue to the relatively poor in the economy, or vice versa. Therefore, even if the gains are higher than the losses, it may not be fair to compare the gains/losses of the rich to the gains/losses of the poor. Accordingly, this study avoids estimating the net impact of trade on poverty; instead, it attempts to quantify how international trade affects the livelihoods of the poor.

The impact of trade on the livelihoods of the poor is examined by estimating the impact of trade on the wages and employment of labour employed in India's unorganized manufacturing sector and agricultural sector. The unorganized sector employs around 80% of the total labour force and hosts the largest number of poor. In addition, detailed estimations are undertaken for assessing the impact of trade on the wages and employment of unskilled labour in the organized manufacturing sector. Trade effects on wage inequality between skilled and unskilled labour are estimated in order to assess the sustainability of trade effects. Further, the study estimates the gender impacts of trade. This becomes essential, given the gender inequality in access to resources in the economy.

Using similar methodology across sectors to estimate the wage and employment effects of international trade on the Indian economy, the following are the **main conclusions and key messages of the study**:

1. Real exports in goods and services, in the period 2003-04 to 2006-07, increased by around $62 billion, which generated employment for 26 million person-years. The most employment was generated in the services sector (12 million); followed by industry (8 million) and agriculture (6 million).

2. Exports in this period generated income of $55 billion in the economy. However, out of this, only 1.6% went to the poor in abject poverty (the lowest income group); 70% of the total income generated went to the top two income groups. Thus, although exports have generated economy-wide employment, the gains

from exports, in terms of higher incomes generated, have not percolated down to the poor section of the economy.

3. The global slowdown has adversely affected India's international trade since October 2008, when export growth became negative for the first time since 2005-06. The consequent job losses in the year 2008-09 were estimated to be 1.16 million person-years. The highest number of job losses occurred in textiles and textile products; followed by ores and minerals; and then in the gems and jewellery sectors. However, some sectors experienced positive export growth and therefore recorded a rise in employment. The net employment created by exports in 2008-09 was 1.25 million person-years.

- **Exports have generated additional employment and incomes in the economy, but these gains have not trickled down to the poor. For the poor to benefit from international trade, it is important to increase their participation in the sectors that are expanding on account of trade. One plausible way of directly linking the poor to trade could be to identify the products produced by the poor, or those that have a greater number of poor people associated with them, and to enhance exports of these products so that the benefits go directly to the poor.**

4. The unorganized sector in India employs around 80% of the labour force. Although exports are mainly carried out by the organized manufacturing sector, exports and imports also affect the unorganized manufacturing sector. This is due to the backward and forward linkages that exist between the organized and unorganized sectors. Exports of industries in the organized sector have led to higher wages and employment in the enterprises in the unorganized sector. However, the size of the enterprise matters. Gains from trade have gone mainly to relatively large enterprises (which employ more than 6 workers). However, these enterprises are also the ones where wages and employment are adversely affected due to higher imports.

5. Interregional disparities exist in respect of trade impacts on wages and employment in the unorganized manufacturing sector. Therefore, the location of the enterprise in the unorganized sector matters. Enterprises that are located in states with a higher export orientation, such as Punjab, Haryana, Gujarat, Maharastra, Andhra Pradesh, Karnataka and Tamil Nadu, have a higher positive impact of increased exports on wages and employment in the large enterprises of the unorganized sector.

6. The agriculture sector is an unorganized sector of India which in 2008-09 contributed 16% to GDP, 52% to employment and around 6% to trade in India. Though the contribution of agriculture to total trade is the lowest of all sectors, since its contribution to employment is the maximum, it is nonetheless an important sector for any analysis of the impact of trade on the poor. Agriculture exports and imports have risen steadily in the latter half of this decade. However,

exports have not led to any increase in the wages of unskilled workers in the agricultural sector. Only in the case of cereals, and fruits and nuts, have exports led to increases in wages. However, imports have adversely affected the wages of unskilled workers in the agriculture sector.

- **The unorganized sector in India acts as a safety valve for absorbing excess employment in the economy. The impact of trade on wages and employment in the unorganized sector can have far-reaching implications for how the poor are affected by trade. In order to absorb excess labour through higher exports and minimize displacing labour through higher imports, it becomes vital to develop strong linkages between the organized and unorganized sectors in the economy. In this regard, township and village enterprise may be encouraged, as China has done.[28] Creating physical and social infrastructure, developing institutions that extend loans and export credits, imparting vocational training and skills to people, and achieving exportable quality for the products produced are some of the means that can go a long way towards accelerating and strengthening the growth of the unorganized manufacturing sector in India and empowering the poor to benefit from trade.**

7. The impacts of trade in the organized sector are more prominent. Unskilled labour has benefited from industrial trade. While exports have increased the wages and employment of unskilled labour, import competition has not adversely affected them. Minimum wages and strict labour firing policies have helped unskilled labour to counter the adverse impact of trade. However, trade has led to increases in wage inequality between skilled and unskilled labour. This casts doubts on the sustainability of the pro-poor effects of trade through benefits to unskilled labour.

8. Unskilled labour in the organized manufacturing sector has also benefited in terms of improvements in labour productivity due to increased domestic competition through higher imports and increased external competition through higher exports.

- **The pro-poor impact of international trade in terms of higher wages and employment of unskilled labour is more prominent in the organized manufacturing sector as compared to unorganized sector. Minimum wages and rigid firing policies in the organized sector have, to some extent, enabled unskilled workers to benefit from trade. However, in order to increase the gains to the poor from trade, it is important to improve their skills and bargaining power. It is important to keep a check on increasing wage inequality between white-collar and blue-collar workers. This can be done by periodically revising the minimum wages. More training programmes and skill enhancement programmes could help in distributing the gains from trade more equitably.**

[28] See Mukherjee and Zhang (2007).

9. The gains from trade should be distributed more equitably across the different income groups, skills groups, and the genders. Lack of equitable access to resources across the genders makes it difficult for the gains from trade to be gender-neutral. In the period 2000-04 to 2006-07, exports generated around 9.38 million person-years of employment for females, and 16.60 million person-years of employment for males. Only 36% of the total employment generated went to women. Nevertheless, the share of women in the additional employment generated by exports is higher than their share in total employment, indicating that exports have led to a lowering of the gender gap in employment.

10. Exports have also led to higher levels of employment of women in total employment in the organized manufacturing industries. However, the impact has been higher in the high-tech industries. This indicates the need for women to acquire higher skill levels and learn better technologies. Rising wage rates lead to higher displacement of women as compared to men. This suggests that in periods of high labour demand, men will benefit more than women.

- **For all sections of the economy to benefit equitably from trade, it is important to have a gender-equitable distribution of the gains from trade. Export-oriented policies can be an important instrument in the hands of policymakers for gender empowerment in India. However, in order for this to happen, gender sensitization of trade policy is required. Gender-sensitive products need to be identified, and a cautious approach should be adopted with respect to promoting exports of these products and ensuring that imports do not displace domestic production of these products. Higher levels of educational and skill enhancement for women can help them in gaining a greater share in trade-generated employment.**

Trade can play a vital role in improving the livelihoods of the poor. However, this goal is beset with several policy challenges, both within the country and internationally. It is a well-recognized fact that trade liberalization does not automatically increase trade, let alone enhance growth. Furthermore, the relationship between trade, growth, income distribution and poverty differs across countries, and is likely to evolve as an economy changes in structure. The changes in product and factor prices triggered by opening up an economy will inevitably produce both winners *and* losers. However, the extent to which the poor are affected by international trade has a bearing on where and how these gains and losses occur. This depends on a number of external factors, which include the stage of development of the country; the timing, scale, and sequencing of policy reforms; and pre-existing domestic and international conditions. Ultimately, *the role of trade in improving the livelihoods of the poor will depend upon the extent to which the poor are able to participate gainfully in the expanding sectors relating to trade*.

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REFERENCES

Acharyya, R (2006). Trade liberalization, poverty, and income inequality in India. INRM policy brief no. 10. Asian Development Bank.

Ahluwalia MS (2002). State-level performance under economic reforms in India. In: Krueger AO ed., *Economic Policy Reforms and the Indian Economy.* University of Chicago Press.

Ahluwalia MS (1976). Income distribution and development. *American Economic Review.* 66 (2): 128–35.

Alcala F and Ciccone A (2001). Trade and productivity. CEPR discussion paper 3095.

Arellano M and Bond S (1991). Some tests of specification for panel data: Monte Carlo evidence and application to employment equations. *Review of Economics Studies.* 58: 277–297.

Banerjee and Newman (2004). Inequality, Growth and Trade Policy. Massachusetts.

Banga Rashmi (2006) "Impact of Liberalization on Wages and Employment in Indian Manufacturing Industries", *Journal of South Asian Studies*, Vol 11-2.

Banga, R (2005a). Liberalization and wage inequality in India. Working paper no. 156, ICRIER working paper series, New Delhi.

Banga, Rashmi (2005). Trade–growth–poverty nexus in Asia–Pacific: Empirical evidence.

Barrell, R.and Pain, N. (1996). 'An econometric analysis of US foreign direct investment'

Barro, Robert and Jhong-Wha Lee (1994). Data set for a panel of 138 countries. National Bureau of Economic Research, Cambridge, Massachusetts.

Basu SR, LR Klein and AL Nagar, (2005). Quality of Life: Comparing India and China. Paper presented at the Project LINK meeting, 1 November, United Nations, Geneva.

Bathla Seema and R K Sharma (2008). Employment and Labour Productivity in Rural Unorganized Manufacturing: Growth, Disparities and Determinants, Unpublished Paper.

Bernard, A. B, J. Bradford Jensen and Peter K. Scholt, (2006). "Trade cost, Firms and Productivity", Journal of Monetary Economics, 53.

Bhagwati, Jagdish and Vivek H. Dehejia (1994) "Freer Trade and Wages of the Unskilled: Is Marx Striking Again?" in J. Bhagwati and M. Kosters, eds, Trade and Wages: Leveling Wages Down? Washington, DC: AEI Press.

Bhagwati, Jagdish and T.N.Srinivasan (2002). Trade and Poverty in the Poor Countries. *American Economic Review* 92/2, (May 2002), 180-83.

Bhalla Sheela (2005). Rural Workforce Diversification and Performance of Unorganized Sector Enterprises, in Rohini Nayyar and Alakh N. Sharma (ed.), Rural Transformation in India: The Role of Non-farm Sector, Institute for Human development, New Delhi, 2005.

Bhalotra, S (2002). "The impact of economic liberalisation on employment and wages in India", International policy group, ILO, Geneva.

Bloch, H. and McDonald, J.T. (1999). 'The Spillover Effects of Industrial Action on Firm Profitability' in Review of Industrial Organization Volume 15, Number 2.

Brainard, S. L (1997). "An Empirical Assessment of the Proximity-concentration Trade-off between Multinational Sales and Trade", American Economic Review, Vol.87.

Cerra, Valerie and Sweta Saxena (2000). What Caused the 1991 Currency Crisis in India?" International Monetary Fund Working Paper No. 00/157

Chadha G.K. (2003). Rural Non-Farm Sector in Indian Economy: Growth, Challenges and Future Direction, paper presented at JNU-IFPRI WORKSHOP on "The Dragon and the Elephant: A Comparative Study of Economic and Agricultural Reforms in China and India, March 25-26, 2003.

Chand, R., D. Jha and S. Mittal (2004). 'WTO and Oilseeds Sector: Challenges of Trade Liberalization', *Economic and Political Weekly*, February 7, 2004, pp 533-537.

Chang, Katlani and Loayza (2005). Openness can be good for growth: The role of policy complementarities. Processed, World Bank, Washington DC.

Choong, C.K., Zulkornain Yusop and Venus Liew Khim Sen (2005). Export led Growth Hypothesis in Malaysia: An investigation using bounds test" Sunway Academic Journal Climate Analysis Tools Indicators, World Resources Institute

Coche, Isabel (2004). Trade liberalization, Gender and Development: What are the Issues and How Can We Think About Them? Second Ministerial Meeting, Advancement of Women, 21-23 April, 2004. Washington, D.C. OEA/Ser.L/II.7.9CIM.REMIMII/doc.4/04, 17 Feb. 2004.

CSR, New Delhi, India (2008). Report on "Impact of Trade and Globalisation on Gender in India: A Case Study of Women Workers in the Fisheries Sector".

Datt, Gaurav (1999), Has Poverty Declined since Economic Reforms: Statistical Analysis, Economic and Political Weekly, Vol No 8.pp. 3514-18. August.

David Dollar and Aart Kraay (2001). Trade, Growth and Poverty. World Bank Policy Research Working Paper No. 2615.

Deaton Angus and Jean Dreze (2002). "Poverty and Inequality in India: A Re-Examination," Working Papers 184, Princeton University, Woodrow Wilson School of Public and International Affairs, Research Program in Development Studies.

Dejong and Ripoll (2006). Tariffs and Growth: An empirical exploration of contingent relationships. *Review of Economics and Statistics,* forthcoming. *Demand Effects of Inward and Outward FDI on UK Industry,* RP0511

Dohlman, E., S. C. Persaud, and M. R. Landes (2003). "India's Edible Oil Sector: Imports Fill Rising Demand", OCS090301, United States Department of Agriculture, Economic Research Service.

Douglas,A. I (2003). Free Trade under Fire, Princeton University Press.

Doyle, E and I. M Zarzoso (2005)."The Productivity, Trade and Institutional Quality Nexus: A panel Analysis. http://www.aeaweb.org

Driffield, N.L. and Taylor, K. (2000). 'FDI and the Labour Market: A Review of the evidence and policy implications, Oxford Review of Economic Policy Volume16, Issue3 Pp. 90-103.

Driffield, Nigel, James H. Love and Karl Taylor (2005). *Productivity and Labour Demand Effects of Inward and Outward FDI on UK Industry,* The University of Sheffield, Department of Economics, Working Papers series.

Durevall, P and F. Munshi (2006). "Trade liberalisation and wage inequality: Empirical evidence from Bangladesh", Department of Economics, School of Business and Law, Gutenberg University, Sweden.

Dutt, P (2003). "Labour market outcomes and trade reforms, The case of India", in Hasan, R and D. Mitra, (ed.), The impact of trade on labour: Issues, perspectives and experience from developing Asia, Haarlem: North-Holland/Elsevier Science B.V

Dutta, V. P (2004). "Trade protection and inter-industry wages in India", PRUS working paper No. 27, University of Sussex, Sussex.

Easterly W (2005). 'National policies and economic growth' in Philippe Aghion and Steven Durlauf, editors, Handbook of Economic Growth, Elsevier, 2005. Economic and Political Weekly, August 25, 34: 3247-54.

Haggblade, Steven, Petr B.R. Hazell and Thomas (2007). *Economics Supplement*. 94: 29–47.

Edwards, A.C and S. Edwards (1994). "Labour market distortions and structural adjustment in developing countries", in H. Susan, et al , (ed.), Labour market in an era of Adjustment, The World Bank, Washington D.C.

Faciane, K. A (2005). "Analysing the Effect of transitory Components on Prices on Volatility Patterns with Feedback Traders", Economics Working Paper Archive at WUSTI.

Feenstra, C.Robert and Gordon H. Hanson (1995). 'Foreign Direct Investment and Relative wages: Evidence from Mexico's Maquiladoras', *NBER WP 5122.*

Feenstra, Robert and Hanson, Gordon 1996. 'Foreign Investment, Outsourcing and Relative Wages' in Robert Feenstra, Gene Grossman and Douglas Irwin (eds), The Political Economy of Trade Policy: Papers in Honor of Jagdish Bhagwati, MIT Press: Cambridge, Mass., pp.89-127.

Feenstra, Robert C. and Gordon H. Hanson 1999. Productivity Measurement and the Impact of Trade and Technology on Wages: Estimates for the U.S., 1972-1990. Quarterly Journal of Economics, August , 114(3), 907-940.foreign competition on industry level wages', Weltwirtliftshaftliches Archiv, Vol. 136, pp. 41–51.

Frankel, Jeffrey and Romer, David (1999). Does Trade Cause Growth? American Economic Review, 89 (3), 379-399.

Freeman, R. B and L. Katz (1993). Difference and changes in wage structure, University of Chicago press, Chicago.

Gera, S and P. Masse (1996). "Employment performance in the knowledge based economy", Industry Canada, working paper No. 14, Canada.

Ghose, A.K. (2000). Trade liberalization and manufacturing employment, Employment Paper no. 2000/3 (Geneva, International Labour Office).

Ghosh, Jayati "Globalisation, Export-oriented Employment for women and social policy: A Case Study of India" UNRISD.

GOI-NCEUS (2007). Report on Conditions of Work and Promotion of Livelihoods in the Unorganized sector, National Commission for Enterprises in the Unorganized sector, Government of India. August.

Goldar, B.N (2002). Trade Liberalization and Manufacturing Employment: The Case of India. Employment Paper no. 2002/34, International Labour Office, Geneva.

Goldar, B.N (2004). Productivity trends in Indian manufacturing in the pre- and post-reform periods. Indian Council for Research on International Economic Relations, New Delhi Working Papers 137, Indian Council for Research on International Economic Relations, New Delhi, India.

Goldar, B.N. 2000. Employment Growth in Organized Manufacturing in India. Economic and Political Weekly , Vol. 35, No. 14, April 1-7.

Goldar, B.N. (2003). Trade Liberalisation and Manufacturing Employment: The Case of India. Employment Paper 2002/34, Geneva, International Labour Office.

Goldar, Bishwanath and Anita Kumari (2002). Import Liberalization and Productivity Growth in Indian Manufacturing Industries in the 1990s, Institute of Economic Growth, Delhi.

Goldar, Bishwanath and Suresh Chand Aggarwal (2004).Trade Liberalization and Price-Cost Margin in Indian Industries, Working Paper no. 130, Indian Council for Research on International Economic Relations, New Delhi.

Goldar, Biswanath (2002).'Trade Liberalization and Manufacturing Employment: The Case India', ILO 2002/34.

Government of India, Unorganized Manufacturing Sector in India, NSS 51st round July 1994 - June 1995, NSS 56th Round (July 2000-June 2001), NSS 62nd Round (July 2005-June 2006), National Sample Survey Organization, Department of Statistics, New Delhi.

Government of India (annual publication). *Economic Survey.* Various issues.

Greeenaway, D., Hine, B. and Wright, P. (2000). 'Further evidence on the effect of foreign competition on industry level wages', Weltwirtliftshaftliches Archiv, Vol. 136, pp. 41–51.

Griliches, Z. (1992). 'The Search for R&D Spillovers', National Bureau of Economic Research, NBER Working Papers series.

Grown, Caren (2005). Trade Liberalization and Reproductive Health: A framework for understanding the linkages. Development, 48, 28-42.

Gulati and Narayanan (2002). Rice Trade Liberalization and Poverty, MSSD Discussion Paper No. 51, International Food Policy Research Institute

Gulati, A. and Narayanan, S. (2002). Rice Trade Liberalisation and Poverty. Markets and Structural Studies Division Discussion Paper No. 51, Washington DC. International Food Policy Research Institute.

Gulati, A., and T. Kelley (1999): *Trade Liberalization and India Agriculture*, (New Delhi: Oxford University Press).

Harrison, Ann (1996). Openness and growth: A time-series, cross-country analysis for developing countries. Journal of Development Economics, Elsevier, vol. 48(2), pages 419-447, March.

Hasan, R (2001). "The impact of trade and labour market regulations on employment and wages: Evidences from developing countries", East-West Center working papers, August, No. 32.

Hasan, R, D. Mitra and. V. Ramaswamy (2007). "Trade reforms, labour regulations and labour-demand elasticities: Empirical evidence from India", The Review of Economic and Statistics, August, Vol. 89, NO. 3.

Hasan, R., D. Mitra and K. V. Ramaswamy (2003). Trade Reforms, Labour Regulations and Labour-Demand Elasticities: Evidence from India. NBER Working Paper 9879, July

Hashim, D. A. (2008). "Indian Oilseed Products Industry: Impact of Tariff Reforms on Sources of Output Growth", *Commodity Vision*, 1(4), 86-96.

Head. K and J. Ries (2001). "Overseas Investment and Firm Exports", Review of International Economics, Vol. 9.

Hill, W. L (2003). International Business, TMH Publishing Ltd., New Delhi.

Hirway I (2008). Trade and gender inequalities in labour market: Case of textiles and garment industry in India, paper presented at International seminar on moving towards gender sensitization of trade policy, organized by UNCTAD, New Delhi, 25-27, February.

IBRD (1969). *Estimation of Long-run Changes in Domestic Demand for Food in LDC's.* (International Bank for Reconstruction and Development).

Income: Estimating the Interrelationships," NBER Working Papers 10750,

Industrial Action on Firm Profitability', Review-of-Industrial-Organization. September, 15(2): 183-200. Institute of Technology and University College London. Unpublished Manuscript.

Jeffrey D. Sachs and Andrew M. Warner, (1997). Fundamental Source of Long-Run Growth. American Economic Review, Papers and Proceedings, May 1997.

Jena, Pradyot Ranjan and Ulrike Grote (2008). Growth–trade–environment nexus in India. *Economics Bulletin.*

Jha, V. et al (2005), Trade Liberalisation and Poverty in India, Macmillan India Limited.

Joshi, Vijay and I.M.D. Little (1996), Indian Economic Reforms 1991-2001, Oxford: Clarendon Press.

Kakawani, N. (1980). On a Class of Poverty Measures. Econometrica.

Kashyap S.P. and Niti Mehta (2007). Non-farm Sector in India: Temporal and Spatial Aspects, The Indian Journal of Labour Economics, (Conference Issue), 50 (4), October-December: 611-632.

Katz, L. F., and K. M. Murphy (1992). 'Changes in Relative Wages, 1963-1987: Supply and Demand Factors', *Quarterly Journal of Economics*, 107, 35—78.

Keesing, D.B (1966). "Labour Skills and Comparative Advantage", American Economic Review, Vol. 56.

Kiresur, V.R., S.V.R. Rao and D.M. Hedge (2001). "Improved Technologies in Oilseeds Production – An Assessment of their Economic Potentials in India", *Agricultural Economic Research Review,* 14(2), 95-108.

Kmenta J. (1967). 'On Estimation of the CES Production Function', *International Economic Review*, 8(2), 180-189.

Korinek, Jane (2005). Trade and Gender: Issues and Interactions. OECD Trade Policy Working Paper No. 24.

Krishna. P and D. Mitra (1998). "Trade liberalisation, market discipline and productivity growth: New evidence from India", Journal of development economics, 56(2).

Krueger, Anne (1983). Trade and Employment in Developing Countries, 3 Synthesis and Conclusions, Chicago, University of Chicago Press.

Krugman, P and L. Robert (1994). "Trade, jobs and wages," Scientific American, April.

Kundu Amitabh, Niranjan Sarangi and Bal Paritosh Das (2005). Economic Growth, Poverty and Non-farm Employment: An Analysis of Rural-Urban Linkages, in Rohini

Nayyar and Alakh N. Sharma (ed) (2005). Rural Transformation in India: The Role of Non-farm Sector, Institute for Human development, New Delhi.

Kundu, Amitabh and Alakh N. Sharma (ed.) (2001). Informal Sector in India-Perspectives and Policies, Institute for Human Development, and Institute of Applied Manpower Research, New Delhi.

Kundu, Amitabh, N. Lalitha and Sant Lal Arora (2001). Growth Dynamics of Informal Sector in Urban India: An Analysis of Interdependencies, in Kundu, Amitabh and Alakh N. Sharma (ed.), Informal Sector in India-Perspectives and Policies, Institute for Human Development, and Institute of Applied Manpower Research, New Delhi.

Kuznets, Simon (1955). Toward a Theory of Economic Growth. In R. Lekachman (ed.), *National Policy for Economic Welfare at Homa and Abroad.* Garden City, NY: Doubleday, pp. 12-85.

Lahiri Committee Report (2006). *Report of the Committee on Rationalization of Customs and Excise Duties on Edible Oils and Oilseed*, Ministry of Finance, Government of India.

Lucas, R.E (1988). On the Mechanics of Economic Development. Journal of Monetary Economics, Vol. 22, pp. 3-42, (1988).

Marjit Sugata and Hamid Beladi (2008). Trade, Employment and the Informal Sector, Trade and Development Review Vol. 1, Issue 1, 7-20.

Marjit, S and R. Acharya (2003). "International trade, wage inequality and developing country: A general equilibrium approach, Heidelberg, Physica/Springer Verlag.

Marjit, Sugata and Kar, Saikar (2007). The Urban Informal Sector and Poverty: Effects of Trade Reform and Capital Mobility in India, PEP-MPIA working Paper # 2007-09.

Markusen, James R. and Anthony J. Venables (1997). 'The Role of Multinational Firms in the wage-gap Debate', *Review of International Economics*, Vol. 5, pp. 435-451.

Mehra Meeta (1985). Urban Informal Sector, Economic and Political Weekly, Vol XX, No 8. pp. 326-332.

Mehta, B. V. (2008). "India's Vegetable Oil Market: Fundamentals and Projection", *Commodity Vision,* 1(3), 56-61.

Menon, N and Y V Rodgers (2007). "Trade competition, market power and gender wage differentials in India's manufacturing sector, www.aeaweb.org/annual-mtg_pp.

Menon, Nidhiya, and Yana Rodgers (2006). The Impact of Trade Liberalization on Gender Wage Differentials in India's Manufacturing Sector. Social Science Research Network Working Paper.

Mukherjee Anit and Xiaobo Zhang (2007). Rural Industrialization in China and India: Role of Policies and Institutions, World Development, 35 (10), October: 1621-1634.

Murthy, K. N. (2001). "Inter-Regional Variation in Consumption Patterns in Semi-arid Tropical India: A Demand System Approach", Indian Statistical Institute, Delhi, *Discussion Paper*.

Nagar, A.L. and S. R. Basu. (2002). "Weighting Socio-Economic Indicators of Human Development: A Latent Variable Approach," in Ullah, A. et al (eds.) Handbook of Applied Econometrics and Statistical Inference, Marcel Dekker, New York.

National Productivity Council (2008). Report on "Impact of Trade and Globalization on Gender" to the UNCTAD India Project.

Nielsen, Chantal Pohl (2002). Vietnam in the International Rice Market: A Review and Evaluation of Domestic and Foreign Rice Policies. Report No. 132, Danish Research Institute of Food Economics, Copenhagen.

Nye, Reddy and Watkins (2002). Dollar and Kraay on trade, growth and poverty: A critique. Processed, Columbia University, New York.

OECD, (1994). "Jobs study: Evidence and explanations" Chapter 3, Paris.

Papola, T.S. (1999). Labour Studies in India: Some Reflections on Developments in the Post Independence Period, The Indian Journal of Labour Economics, Vol.42, No.2, pp. 175-185.

Pavaskar, M and A. Kshirsagar (2008). "Paradox in India's Trade in Oilseed Products", *Commodity Vision*, 1(3), 48-54.

Persaud, S. and M. R. Landes (2006). *The Role of Policy and Industry Structure in India's Oilseed Markets*, United States Department of Agriculture, Economic Research Report, Number 17, April.

Petia Topalova (2005). Trade Liberalization, Poverty and Inequality: Evidence From Indian Districts, Working Paper 11614

Poverty Dynamics in Vietnam", *Journal of Economic Integration*, Vol.22, No.4, pp.819-851.

Puri, Lakshmi (2004). 'Trade and Gender: Opportunities and Challenges for Developing Countries' in Trade in Services, Gender and Development, UNCTAD, Geneva.

Purushothaman, Roopa (2008). Is Urban Growth good for rural India. United Nations Expert Group Meeting on Population Distribution, Urbanization, Internal Migration and Development

Raghubendra Jha (2000). Paper prepared for the WIDER project "Rising Income Inequality and Poverty Reduction: Are they Compatible?

Raihan S., R. Khatoon, M. Jami Husain, S. Rahman (2007). Modelling Gender Impacts of Policy Reforms in Bangladesh: A Study in a Sequential Dynamic CGE Framework. PEP Working Paper (Revised Draft, June, 2007), Poverty and Economic Policy (PEP), MPIA Project, Canada.

Raj S N Rajesh and Malathy Duraisamy (2006). Economic Reforms, Efficiency Change and Productivity Growth: An Inter-State Analysis of Indian Unorganized Manufacturing Sector.

Ramesh Chand (1999). "Effects of Trade Liberalization on Agriculture in India: Commodity Aspects" in The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre).

Rani, Uma and Jeemol Unni (2004). Unorganized and Organized Manufacturing in India: Potential for Employment Generating Growth, Economic and Political Weekly, Vol.XXXIX, No.41, pp. 4568-4580. October 9.

Rao, C.H. Hanumantha (1994). Economic Reforms and the Prospects for Rural Labour, The Indian Journal of Labour Economics, Vol. 37, No.1.

Ravallion, Martin (2001). Growth, Poverty and Inequality: Looking beyond Averages. Development Research Group, World Bank.

Ravallion, M and G. Datt (2000). When is Growth Pro-Poor? Evidence from the Diverse Experience. Policy Research Working Paper Series 2263, Development Research Group, World Bank.

Ravallion, Martin & Chen, Shaohua (2003). Measuring pro-poor growth. Economics Letters, Elsevier, vol. 78(1), pages 93-99, January.

Ravallion, Martin (2001). Inequality convergence. Policy Research Working Paper Series 2645, World Bank.

Reardon (2007) (ed.), Transforming the Rural Nonfarm Economy: Opportunities Economy, Industry Canada Working Paper No. 14, Human resource Development, Canada W-97-9E/F, Canada.Economy, University of Chicago Press, vol. 94(5), pages 1002-37, October.

Reserve Bank of India (2007). *Handbook of Statistics on the Indian Economy.*

Riddle, Dorothy I (2004). A Gender –Based Analysis of International Trade in Services in *Trade and gender: Opportunities and Challeneges for Developing Countries* (UNCTAD, United Nations, Geneva and New York).

Rigobon Roberto & Dani Rodrik (2004). "Rule of Law, Democracy, Openness, and Income: Estimating the Interrelationships" (NBER Working Paper No. 10750).

Robbins, D (1996). "HOS hits facts: Facts win; Evidence on trade and wages in the developing world", Development discussion paper No. 557, HIID.

Robert J Barro (1999). Determinants of Economic Growth: Implications of the Global Evidence for Chile. Latin American Journal of Economics, Instituto de Economía. Pontificia Universidad Católica de Chile., vol. 36(107), pages 443-478.

Rodriguez, F and Rodrik, D (2001). Trade Policy and Economic Growth: A skeptic's guide to the cross-sectional evidence. In Ben S. Bernanke and Kenneth Rogoff (eds.). *NBER Macroeconomics Annual 2000*. National Bureau of Economic Research, Cambridge, MA.

Rodrik, Dani (2000). Comments on trade, growth and poverty by Dollar and Kraay. Processed, Harvard University, Cambridge, MA.

Rodrik, Dani (2007). One Economics, Many Recipes: Globalization, Institutions,

Romer, Paul M (1986). Increasing Returns and Long-run Growth. Journal of Political Economy, Univeristy of Chicago Press.

Sachs, Jeffrey D. and Warner, Andrew (1995). "Economic Reform and the Process of Global Integration", in William C. Brainad and George L. Perry, (eds.), Brookings Papers on Economic Activity, 1, 1-118.

Samal Kishor, C. (1990). Linkages between Informal and formal Sector, Economic an Political Weekly, Vol XXV, No 8.pp. 1287.

Sargan, J. (1958). The estimation of economic relationships using instrumental variables. Econometrica 26(3): 393{415}.

Sharma R.K. and Abinash Dash (2006). Labour productivity in Small Scale Industries in India: A State-Wise Analysis, The Indian Journal of Labour Economics, 49 (3):407-427.

Sharma R.K. and Seema Bathla (2008). Regional Dimensions of Rural Industrialization in India: Patterns and Challenges, Paper Presented at a National Seminar on 'Rural Industrialization in Punjab: Challenges and Strategies' during March 4-5 2008 at Guru Nanak Dev University, Amritsar.

Shaw, A. (1990). Linkages of Large Scale, Small Scale and Informal Sector Industries: A Study of Thana Belapur, Economic and Political Weekly, Vol. XXV, No 8. pp. M17-M22. Feb. 17-24.

Singh Richa (2008). Economic Reforms and Well being of Rural Lbaour in India: An Inter Regional Analysis, Unpublished Ph.D. Thesis, Submitted to Jawaharlal Nehru University, Centre for the Study of Regional Development.

Srinivasan, P. V. (2005). *Impact of Trade Liberalisation on India's Oilseed and Edible oils Sector*, Report prepared for IGIDR-ERS/USDA Project: Indian Agricultural Markets and Policy, Indira Gandhi Institute of Development Research, February 2, Mumbai.

Srivastava, Ravi and Richa Sing (2005). Economic Reforms and Agricultural Wages in India, The Indian Journal of Labour Economics, Vol. 48, No.2, April June, pp. 407-424.

STADD, New Delhi, India (2008). Report on "Impact of Trade and Globalisation on Women Workers in the Handicraft Sector: Evidence from the Carpet and Embroidery Sectors".

Sundaram, K. (2007). Employment and Poverty in India, 2000-2005, Economic and Political Weekly, Vol. XXXXII, No 30. pp.3121-3131. July 28-August 3.

Tendulkar, S. (2000). Employment Growth in Factory Manufacturing Sector during Pre- and Post-Reform Periods. Paper presented at a Conference to honour Professor K.L. Krishna on the theme 'Industrialization in a Reforming Economy: A Quantitative Assessment', Delhi School of Economics, Delhi, December 20-22, 2000.

Tendulkar, S. D. (2003). Organized Labour Market in India: Pre and Post Reform. Paper prepared for the Conference on Anti Poverty and Social Policy on January 2-4 at Alwar, India.

Teixeira A and Fortuna N (2006). Human capital, trade and long-run productivity. Testing the technological absorption hypothesis for the Portuguese economy, 1960–2001.

Thakur C.P. and C.S. Venkata Ratnam (2007). Conditions of Work in the Unorganized Sector in India, The Indian Journal of Labour Economics, (Conference Issue), Vol. 50 No. 4, pp. 749-774. October-December.

Topalava, P (2004). "Trade liberalisation and firm productivity: The case of India, IMF working paper 04/28.

Topalova, Petia (2005), Trade liberalization, poverty and inequality: Evidence from Indian Districts, NBER working paper no. 11614.

Tran-Nguyen A-N (2004). The Economics of Gender Equality, Trade and Gender. In: *Trade and Gender: Opportunities and Challenges for Developing Countries*. (UNCTAD, United Nations, Geneva and New York).

Uchikawa, S. (2001). Investment Boom and Underutilisation of Capacity in the 1990s. Economic and Political Weekly

Uchikawa, S. (2002). Investment Boom and the Capital Goods Industry, in S. Uchikawa (ed.), Economic Reforms and Industrial Structure in India, New Delhi: Manohar Publishers.

United Nations (2000). United Nations Millennium Declaration. General Assembly resolution 55/2.

United Nations (2000). United Nations Millennium Development Goals (http://www.un.org/millenniumgoals).

UNCTAD (2008). *The Least Developed Countries Report 2008: Growth, Poverty and the Terms of Development Partnership*. United Nations publication. Sales no. E.08.II.D.20. New York and Geneva.

UNCTAD (2010). *Trade and Development Report 2010: Employment, Globalization and Development.* United Nations publication. E.10.II .D.3. New York and Geneva.

UNCTAD (2010). Evolution of the international trading system and of international trade from a development perspective: The impact of the crisis-mitigation measures and prospects for recovery. TD/B/57/3.

UNCTAD (2010). Successful trade and development strategies for mitigating the impact of the global economic and financial crisis. TD/B/C.I/7.

United Nations Development Programme. *Human Development Report.* Various issues.

Unel, Bulent (2003). Productivity Trends in India's Manufacturing Sectors in the last Two Decades, IMF Working Paper no. WP/03/22.

Unni, Jeemol, Lalitha, N. and Rani, Uma (2000). "Economic Reforms and Productivity Trends in Indian Manufacturing," Working Paper No.119, Gujarat Institute of Development Research (GIDR), Ahmedabad, India.

USAID (2006). Report on "Has Trade Liberalization in South Africa affected Men and Women Differently?"

Vasudeva-Dutta, Puja (2004). "Trade Liberalization and the Industry Wage Structure in India", Paper presented at the Third GEP Postgraduate Conference, University of Nottingham, 31 March. Paper downloaded from http://www.sussex.ac.uk/Units/PRU/wps/wp27.pdf

Vijaya, Ramya (2003). Trade, Skills and Persistence of Gender Gap: A Theoretical Framework for Policy Discussion. International Gender and Trade Network, January 2003.

Villasenor, J.A. and Arnold, B.C. (1989). Elliptical Lorenz Curves. *Journal of Econometrics*, Vol. 40, pp. 327-338.

Virmani, A., B. Goldar, C. Veeramani, and V. Bhatt (2004). Impact of Tariff Reforms on Indian industry: Assessment Based on a Multisector Econometric Model, ICRIER Working Paper no. 135.

Warner, Andrew (2003). Once more into the breach: Economic reform and global integration. Center for Global Development, Washington DC.

Williams, Mariama (2002). The Political Economy of Tourism Liberalization, Gender and the GATS". Occasional Paper Series on Gender, Trade and Development, Center of Concern - Global Women's Project, International Gender and Trade Network – Secretariat.

Winters, L. A (2004 b). Trade Liberalisation and Economic Performance: An Overview' Winters, L. A., N. McCulloch, and A. McKay (2004 a) "Trade Liberalization and Poverty: The Evidence So Far." *Journal of Economic Literature* 42 (March): 72–115.

Winters, L. A., N. McCulloch, and A. McKay (2004). "Trade Liberalization and Poverty: The Evidence So Far." *Journal of Economic Literature* 42 (March): 72–115.

Winters, L. A., Y. Niimi, and P. Vasudeva Dutta (2007). Trade liberalization and poverty dynamics in Viet Nam. *Journal of Economic Integration*, Vol.22, No.4, pp.819–851.

Wood, A (1997). "Openness and wage inequality in developing countries: The Latin American challenge to East Asian conventional wisdom", The World Bank Economic Review, Vol.11, No. 1.

World Bank (1997). *India-The Indian Oilseeds Complex: Capturing Market Opportunities*, Report No. 15677-IN, Rural Development Sector Unit, South Asia Region, 31 July.

Zalkilwhal, O (2000). "Trade and wages: A Non-Stolper-Samuelson explanation: Evidence from Canada", Phd. Dissertation, Department of Economics, Carleton university, Attowa.

Websites and databases:

Annual Survey of Industries
FAO Stats
http://www.indiastat.com
KILM 2005 (ILO)
LABORSTA (ILO)
Labour Bureau of India
Ministry of Labour: various annual reports, http://labour.nic.in
http://www.nationmaster.com
Population Foundation of India
http://rbi.org.in
http://saarc-sec.org
http://www.un.org/esa/population/publications/countryprofile/india.pdf
World Integrated Trade Solution (WITS)
World Development Indicators

APPENDIX I: METHODOLOGY AND VARIABLES

A.1 Introduction

The main objective of the study is to estimate the extent to which the wages and employment of the poor are affected by international trade in India. For this purpose, two kinds of analyses have been conducted. Firstly, at the economy level, direct and indirect employment generated by exports has been estimated; and secondly, a separate analysis has been conducted for the organized and unorganized sectors of the economy to estimate the impact of international trade on the wages and employment of the poor. Different methodologies have been used for the two analyses. For economy-wide impact, an input–output matrix has been used, while for estimating the impact on the organized and unorganized sectors, a common methodology has been adopted, i.e. the same econometric models have been estimated. This makes the results across the organized and unorganized sectors comparable.

The analysis relating to the employment generated by exports in the 2003-04 to 2006-07 period is undertaken for 46 subsectors of the economy. The generation and distribution of incomes from exports are estimated for five income groups, out of which two income groups are below the poverty line. The loss of employment in the subsequent years, i.e. 2007-08 to 2009-10, due to the global slowdown and the subsequent decline in exports is estimated for 10 major sectors of the economy. To estimate the impact of the international trade of an industry on the wages and employment of the skilled and unskilled labour employed, labour demand and supply equations have been derived from the CES production function. Using the same production function, a wage rate equation has also been derived. Depending on the kind of data set that is available, appropriate econometric methodologies have been used to arrive at results for specific sectors.

For the unorganized sector, cross-section data for 82,000 enterprises is used for the year 2005; whereas for the organized sector, the analysis is undertaken at the industry level using data for 54 industries for the period 1998-99 to 2005-06. To estimate the impact of trade on the wages of unskilled labour in the agriculture sector, the analysis is undertaken (a) for all agricultural products together; and (b) separately for three agricultural products namely fruits and nuts, cereals, and vegetable roots and tuber. The analysis is undertaken at the state level, using data for 14 major states of India for the period 1991-92 to 2000-01. The choice of period and the level of analysis have been mainly guided by the availability of the dataset.

For the unorganized sector, since cross-section analysis is undertaken, the impact of trade on the wages and employment of unskilled labour is estimated simultaneously using 2SLS. For the organized sector, panel data analysis is undertaken and dynamic panel data estimation techniques are applied using GMM-IV. To estimate the impact of trade on the wages of unskilled labour in agriculture and on gender, we use the same methodology,

i.e. GMM-IV. In addition, gender employment multipliers have been estimated using SAM (Social Accounting Matrix) for the year 2003-04 for 46 subsectors in the economy.

Section A.2, which follows, presents the methodology adopted for estimating the impact of increases and declines in exports on employment and incomes. Section A.3 presents the derivation of labour demand equation and wage rate equation from the CES production function. Section A.4 presents the equation estimated for capturing the impact of trade on labour productivity. Section A.5 presents the derivation of the equation estimated for estimating the impact of trade on wage inequality between skilled and unskilled labour. Finally, section A.6 discusses some methodological issues.

A.2. Methodology for estimating the impact of exports on economy-wide employment and the incomes of the poor

A.2.1 Methodology for estimating the impact of exports on economy-wide employment

To estimate the impact of increases in exports in the 2003-04 to 2006-07 period on economy-wide employment, the input–output matrix for India for the year 2003-04 is used, and employment multipliers for 46 subsectors of the economy are used. The increase in exports from 2003-04 to 2006-07 across these subsectors is first recorded. Exports in each sector in 2006-07 have been deflated to remove any price effects. The actual increase in exports in different subsectors is assumed as the change in the output of each sector. These changes, for any particular sector, will include both the direct increase in output of the sector caused by exports, as well as the indirect increase in output that is generated because of the rise in demand due to exports of any other good in which the sector's output is used as an input. For example, a rise in exports of food products will generate an induced demand for food crops.

The employment multipliers give the additional employment that will be generated due to rises in exports. As in the case of output increase, employment increase in a sector will include both direct as well as indirect increases in employment generated by exports.

Using the change in output due to exports in each subsector, output and employment multipliers are derived. We define the output multiplier of a subsector as the amount by which the total output of the economy increases for a unit increase in the output of that sector. It is usual to measure the unit change in INR lakhs (00,000) or 0.1 million. Thus, if the output multiplier for a sector is 4, this implies that for every INR 1 lakh (100,000) increase in the sectoral output, the total output of the economy increases by INR 4 lakh (400,000); in other words, an increase in total output by 0.4 million for every increase in sectoral output by 0.1 million rupees. Similarly, the employment multiplier of a sector gives an estimate of the aggregate direct and indirect employment changes, in person-years, resulting from the increase in INR 100,000 of output of that sector.

A.2.2 Methodology for estimating the impact of an increase in exports on incomes

To estimate the impact of an increase in exports on the incomes of low-income groups, the increase in value added has been estimated using the corresponding increase in employment. The share of labour and capital in value added has been taken from the input–output matrix. It is assumed, based on economic theory, that the increase in value added by labour will be same as the increase in the share of labour in total income generated. The distribution of the increase in income across different income groups is arrived at by using National Sample Survey (NSS) data on incomes across rural and urban households in different income strata. Income generated by exports has been estimated for five income groups across rural and urban areas, including the lowest income group, i.e. people in abject poverty.

To arrive at these categories, the population is divided into 5 rural and 5 urban expenditure classes. For 1999-2000, detailed item-wise expenditures by expenditure class are given in NSS report no. 461. NSS also gives the population in each expenditure class. Using these expenditure data, the relative expenditure of each expenditure class is obtained for most of the sectors. For a few sectors, the distribution of related or broad groups is used. The total sector-wise private final consumption expenditure (PFCE) is divided into expenditure classes by applying the relative sector-wise expenditure of each class.

The NSS gives the consumption expenditure by twelve classes for rural and urban areas. We club these classes into five. The first two classes refer to population below abject poverty and below the poverty line, and the next class is taken up to the expenditure class covering the average per capita expenditure for rural as well as urban areas. The upper four classes have been clubbed into two classes, as mentioned below.

Table 4.1 Expenditure classes into which PFCE is divided

Rural	**Expenditure class** (Rs. per month)	**Urban**	**Expenditure class** (Rs. per month)
RH1	000-255	UH1	000-350
RH2	255-340	UH2	350-500
RH3	340-525	UH3	500-915
RH4	525-775	UH4	915-1500
RH5	775- above	UH5	1500- above

A.3 Methodology for estimating the impact of the global slowdown on employment

Using the latest available input–output matrix for India for the year 2003-04, the impact of decline in exports due to the global slowdown on employment has been estimated for 10 major sectors of the Indian economy for the years 2007-08 and 2008-09.

Using the actual sector-wise exports for the years 2006-07 and 2007-08, provided by the Reserve Bank of India (RBI), change in exports has been calculated for subsectors of the input–output matrix. Using the Leontif inverse matrix, the change in output across different sectors subsequent to change in output for each sector (due to change in exports) has been estimated. Applying the labour coefficients across the sectors, total employment change (which is direct as well as indirect) is arrived at for each sector. These are further summed up to arrive at change in total employment and change in employment for 10 major sectors.

The estimated impact on employment for a sector includes both direct increase in employment of the sector caused by exports, as well as indirect increase in employment which is generated because of the rise in exports of other sectors that use the sector's output as their inputs. For example, employment in agricultural products may rise because of an increase in their exports and because of an increase in the demand for these products as exports of processed food products and textiles and textile products increase.

A.4 Methodology adopted for impact of trade on wages and employment in the unorganized sector

Lack of research on trade-related effects on the unorganized sector is mainly due to the lack of data on the trade orientation of the industry to which enterprises in the unorganized sector belong, as well as corresponding labour market variables such as wages and employment. Furthermore, data on unorganized manufacturing is provided by the National Sample Survey Organization (NSSO) with a gap of five years, which makes it difficult to undertake empirical analysis based on consistent data over a long period.

Another issue of concern in analysing the impact of trade on labour markets in the unorganized sector is that trade data is available at the product level, while data on wages and employment in the unorganized sector is available at the enterprise level. To overcome the data limitations, a concordance matrix has been constructed between HS 2002 six-digit product level classification and three-digit level industrial data at National Industrial Classification (NIC). Using this concordance matrix, trade data at the industry level is constructed. Data at the enterprise level for the unorganized sector also reports the code of the industry in which the enterprise operates. Using the enterprise level data on wages and employment from the National Sample Survey (62^{nd} round) for the year 2005-06 and the corresponding industry code, trade data at the industry level in which the enterprise operates is constructed. Using this, the impact of trade at the industry level on wages and employment at the enterprise level in the unorganized sector is estimated.

At the industry level, NSS data reports the NIC three-digit level industry code for each enterprise. There are 24 groups at two-digit level of industries (based on National Industrial Classification) engaged in a wide range of activities, from manufacturing of cotton ginning-cleaning (code 1405), food and food products (code 15), tobacco (code 16), textiles (code 17), wearing apparels (code 18), wood and wood products (code 20), and paper and paper products (code 21), to manufacturing of basic metals (code 27), electrical machinery and transport equipments (code 31), radio-television (code 32),

furniture (code 36) and recycling (code 37). At three-digit level, nearly 67 industries are identified.

NIC Code	Description	NIC Code	Description
1405	Cotton ginning, cleaning and baling	25	Manufacture of Rubber and Plastics Products
15	Manufacture of Food Products and Beverages	26	Manufacture of Other Non-Metallic Mineral Products
16	Manufacture of Tobacco Products	27	Manufacture of Basic Metals
17	Manufacture of Textiles	28	Manufacture of Fabricated Metal Products, Except Machinery and equipment
18	Manufacture of Wearing Apparel; Dressing and Dyeing of Fur	29	Manufacture of Machinery and Equipment Not Elsewhere Classified.
19	Tanning and Dressing of Leather;	30	Manufacture of Office, Accounting and Computing Machinery
	Manufacture of Luggage, Handbags, Saddlery, Harness and Footwear	31	Manufacture of Electrical Machinery and Apparatus Not Elsewhere classified
20	Manufacture of Wood and of Products of Wood and Cork, Except	32	Manufacture of Radio, Television and Communication Equipment and apparatus
	Furniture; Manufacture of Articles of Straw and Plating Materials	33	Manufacture of Medical, Precision and Optical Instruments, Watches and clocks
21	Manufacture of Paper and Paper Products	34	Manufacture of Motor Vehicles, Trailers and Semi-Trailers
22	Publishing, Printing and Reproduction of Recorded Media	35	Manufacture of Other Transport Equipment
23	Manufacture of Coke, Refined Petroleum Products and Nuclear Fuel	36	Manufacture of Furniture; Manufacturing Not Elsewhere Classified.
24	Manufacture of Chemicals and Chemical Products	37	Recycling

The impact of trade (exports and imports) on labour demand, wage rates and labour productivity in unorganized manufacturing is empirically estimated for the year 2005-06 based on enterprise-level NSS data of 81,000 enterprises at three digit levels.

As mentioned earlier, the unorganized manufacturing sector in India comprises three segments: microenterprises, small enterprises, and large enterprises. Recognizing a diverse pattern across these three types of enterprises, the regression analysis is carried out separately for all three types of enterprises. As microenterprises are family-based enterprises with no hired workers, these are finally dropped from the analysis, as employment and wage rates are not relevant for microenterprises. The results are presented for all three categories of enterprises taken together, as well as for small enterprises and large enterprises separately.

Variables estimated

1. Export intensity and import intensity of the industry to which the enterprise belongs: Export intensity/import intensity is calculated as the percentage of the exports/imports of each industry in the total output of that industry. To arrive at the industry-level data on exports and imports, a concordance matrix between six-

digit product-level data on HS 2002 codes from DGI&S and three-digit NIC 98 has been constructed. Industrial output is derived from the Annual Survey of Industries for the year 2005-06 and industry-level export and import intensities are estimated.

2. State export orientation:

   The state-wise export orientation is estimated by first constructing industry-level shares of exports in a state. The value of output of each three-digit-level industry that can be attributed to a state is estimated by multiplying India's exports from the industry by the ratio of the industry's output in the state to the total output of the industry at All India level. It is assumed that the share of a state in India's exports of industry *i* is the same as its share in India's production from industry *i*. By summing the estimated exports of each industry in a state, total state-level exports are obtained. By dividing total state-level exports by India's total exports, state export orientation is arrived at.

The variable has been calculated as follows:

State export orientation =

$$\sum\{\frac{State's\ output\ in\ Industry\ i}{India's\ Total\ output\ in\ Industry\ i} \times \text{exports of } Industry\ i\} / India's\ Total\ Exports_i$$

Using the above formula, we estimate the export orientation of the states for the year 2005-06. Data from the Annual Survey of Industries is used to estimate the output of the industries, and the concordance matrix, as discussed above, has been used to arrive at corresponding export figures for each three-digit-level industry in a state. Column 1 of Table A.4.1 reports the top nine states in descending order, following estimates of export orientation of the states undertaken in accordance with the methodology outlined above. Column 2 of the table shows the shares of states in exports in the year 2006-07 as reported by the Economic Survey 2007-08, which for the first time uses the actual export data at the state level.

According to the Economic Survey 2007-08, Maharashtra, Gujarat, Tamil Nadu, Karnataka, Andhra Pradesh, Haryana and Uttar Pradesh are some of the states with a significant share in total exports. From the calculations undertaken above, these are also the states which are more export-oriented, measured by the aggregate of the industry shares in total exports of the industries in each state (Table A.4.1). The estimated shares and ranking of the top ten states arrived at by estimating the state export orientation is quite close.

Table A.4.1 Comparing export orientation with shares in total exports of states

STATES	Export Orientation of States 2005-06 (1)- (our estimates)	STATES	Share in Total Exports (2006-07) (2) (Economic Survey)
Gujarat	23.69	Maharashtra	28.6
Tamil Nadu	12.31	Gujarat	19.2
Maharashtra	11.62	Tamil Nadu	10.4
Karnataka	11.42	Karnataka	10
Uttar Pradesh	6.16	Andhra Pradesh	4.3
Haryana	4.24	West Bengal	3.2
Andhra Pradesh	4.2	Haryana	3
West Bengal	3.97	Uttar Pradesh	2.9
Rajasthan	3.75	Rajasthan	2.7

A.5 Derivation of labour demand and wage-rate equations

Labour demand and wage rate equations can be derived from Cobb-Douglas or CES production functions.

Cobb-Douglas production function and labour demand equation

To consider how variables such as technology, trade and FDI may have an effect on absolute employment, a simple static profit-maximizing model of firm behaviour (based upon Greenaway et al., 1999) can be used, assuming a Cobb-Douglas production function of the form:

$$Y_{it} = A_{it}^{\gamma} K_{it}^{\alpha} N_{it}^{\beta}$$

where Y is real output, K is the capital stock and N is the units of labour utilized. A profit-maximizing firm will employ capital and labour up until the point at which the marginal revenue product of capital equals the user cost r and the marginal revenue product of labour equals the wage w. Solving simultaneously and re-arranging to eliminate capital from the expression yields:

$$Y_{it} = A_{it}^{\gamma} \left(\frac{\alpha N_{it}}{\beta} \times \frac{w_{it}}{r_{it}} \right)^{\alpha} N_{it}^{\beta}$$

The parameter *A* is allowed to vary across time in the following way:

$$A_{it} = Tech_{it}^{\gamma_1} \times Trade_{it}^{\gamma_2} \times FDI_{it}^{\gamma_3} \times e^{\gamma_4 T}$$

where and *T* is a time trend. Rearranging equations and taking a logarithmic transformation yields:

$$\ln N_{it} = \eta - \delta T - \phi \ln Tech_{it} + \lambda \ln Trade_{it} + \psi \ln FDI_{it} + \pi \ln(w/r)_{it} + \rho \ln Y_{it}$$

$$\ln N_{it} = \eta - \delta T - \phi \ln(R\&D/Y)_{it-1} + \lambda \ln(Imports/Y)_{it} + \varphi \ln(Exports/Y)_{it} + \psi \ln FDI_{it} + \pi \ln(w/r)_{it} + \rho \ln Y_{it} + \sigma \mathbf{M}_{it} + \omega_i + \varepsilon_{it}$$

Finally, allowing trade to take the form of import and export intensity (Greenaway et al., 1999) yields:

R&D/Y is a measure of technology intensity, *Imports/Y* is import intensity, *Exports/Y* is export intensity, *FDI* is the proportion of foreign equity invested in industry *i*, w/r is captured by the K/L ratio, and Y is the total sales. Vector ***M*** contains sector controls.

CES production function and labour demand equation

The analysis in this study derives labour demand and wage rate equations from the CES production function. For this purpose, we assume a two-input CES production function, which embodies labour-augmenting technological progress [following Brown and de Cani (1963)] and allows for non-constant returns to scale provided that the function remains homogenous of degree μ, i.e.

$Q = \chi [s(k)^{-\rho} + (1-s) (Le^{\lambda t})^{-\rho}]^{-\mu/\rho}$ ……(a)

Where $\chi > 0$ & $0 < s < 1$

Q is the output, k is the capital, s is the share parameter and ρ determines the degree of substitutability of the inputs. The elasticity of substitution can take any non-negative constant value (including unity, as in the Cobb-Douglas case), and technical progress is labour-augmenting at the rate of λ. χ is the efficiency parameter as it changes output in the same proportion for any given set of input levels, and the parameter can be interpreted as a distribution parameter since it determines the distribution of income through the factor payments.

Since *direct* estimation of the parameters of the CES production function would require simultaneous estimation of a system of nonlinear equations,[29] much of the literature adopts *indirect* estimation methods that exploit the marginal productivity conditions implied by profit maximization behaviour.

To examine the factors that affect the demand for labour and consequently the employment in an industry, we use the standard marginal productivity theory, and equate marginal product of labour (MP_L) to the real wage (W/P). The derived labour demand equation is:

Ln (L) it = β0 + β1 ln (Q) it + β2 ln (W/P) it - β3 EXPORTS it + β4 IMPORTS it + αi + e it……(1)

CES production function and wage rate

Following the standard economic theory, we arrive at the wage rate equation. In a competitive labour market, firms will hire workers until MC_L (which is wage rate) equals MR (which is price x MP_L). Labour demand is given by MP_L. Assuming that labour supply is a function of the average wage rate, we get:

$Ls = \beta (w/p) r$
$Log (Ls) = b0 + r \ln(w/p)$

Equating labour supply to labour demand we get: wage rate as a function of:

(w/p) it = F [Q it , LP it , EXPORTS it , IMPORTS it , Time, Fixed Effects],……(2)

However, in an empirical framework, along with the above factors, we need to include other potential demand shifters, which may also control for industry-specific effects. This is justified by arguing that merely including the factors derived from theory may not capture other influences, which could affect an industry's demand function (Driffield and Taylor, 2000). Inter-industry variations are controlled for by including capital-labour ratios. Two specifications of the equation are estimated: controlling for technology and without controlling for technology.

A.6 Labour demand equation estimated for the unorganized sector

The impact of trade (exports and imports) on labour demand and wage rates in unorganized manufacturing is empirically estimated for the year 2005-06 based on enterprise-level NSS data on 81,000 enterprises at three-digit level.

[29] In general, the estimation of production functions is problematic, not just because they are usually nonlinear in their parameters, but also because the level of the inputs is jointly determined with the level of output. As a result, the presence of *endogenous* explanatory variables will lead to problems of simultaneity bias. In addition, the inputs are unlikely to be independent, raising the possibility of multicollinearity.

The unorganized manufacturing sector in India comprises three segments: microenterprises, small enterprises, and large enterprises. Recognizing a diverse pattern across these three types of enterprises, the regression analysis is carried out separately for all three enterprises. However microenterprises, being family-based enterprises with no hired workers, are finally dropped from the analysis, as employment and wage rates are not relevant for microenterprises. Regressions are also undertaken for all three categories of enterprises taken together, and for small enterprises and large enterprises separately. Deriving from the CES production function, the labour demand equation therefore becomes:

Ln (L) it = β0 + β1 ln (Q) it + β2 ln (W/P) it - β3 EXPORTS it + β4 IMPORTS it + αi + e it

However, apart from these variables which may affect the employment of an enterprise, the export orientation of the industry to which the enterprise belongs may impact the employment of the enterprise. Furthermore, it is argued that the location of the enterprise may affect the employment too. After controlling for the size of the enterprise and the wage rate, enterprises located in states that are trade-oriented may have a higher demand for labour, because of technical progress which is labour-augmenting. Higher linkages between organized and unorganized sectors in export-oriented states may be a plausible reason for this. Import competition, on the other hand, may adversely affect the employment demand in the unorganized sector, depending on the state's share in total domestic production. The equation estimated is therefore:

$$\ln emp_f = \theta_f + \alpha_f \ln(GVA_f) + \beta_f \ln(wrate_f) + \gamma_f \ln(stateor_i) + \delta_f \ln(\exp int_i \ or \ imp int_i) + \iota_f StateDum + \varepsilon_f \quad .....(1)$$

where,
emp_f = total employment in enterprise *f*
GVA_f = Gross Value Added by enterprise *f*
$wrate_f$ = wage rate in enterprise *f*
$stateor_f$ = states' export orientation to which the enterprise belongs
$expint_i$ = export intensity of the industry to which the enterprise belongs
$impint_i$ = import intensity of the industry to which the enterprise belongs
StateDum = state dummies to capture the other state-specific effects

<u>Wage rate equation estimated for unorganized sector</u>

Equating labour supply to labour demand wage rate is obtained as a function of output (Q), labour productivity (LP), export-intensity (EXPORTS) and import-intensity (IMPORTS) :

$(w/p)_{it} = F [Q_{it} , LP_{it} , EXPORTS_{it} , IMPORTS_{it}]$

At the enterprise level, we estimate the following equation which incorporates the export intensity of the industry to which the enterprise belongs and the trade orientation of the states.

$$\ln wrate_f = \varphi_f + \alpha_f' \ln(GVA_f) + j_f \ln(lp_f) + \gamma_f' \ln(stateor_i) + \delta_f' \ln(\exp int_i \ or \ imp int_i) + \iota_f' StateDum + \varepsilon_f \quad .....(2)$$

where,
emp_f = total employment in enterprise *f*
GVA $_f$ = Gross Value Added by enterprise *f*
wrate $_f$ = wage rate in enterprise *f*
stateor $_f$ = states' export orientation to which the enterprise belongs
$expint_i$ = export intensity of the industry to which the enterprise belongs
$impint_i$ = import intensity of the industry to which the enterprise belongs
StateDum = state dummies to capture the other state-specific effects
lp = labour productivity

The impact of exports and of import competition on wages and employment has been estimated using ordinary least squares (OLS) and two-stage least squares (2SLS) models in order to check the consistency of the results across different methodologies.

OLS may not be the most appropriate estimator to estimate a single equation embedded in a system of simultaneous equations if one or more of the stochastic explanatory variables is correlated with the stochastic disturbance term in that equation, as the estimators obtained may be inconsistent. The 2SLS regression technique extends regression analysis to include models that violate the OLS assumption that the disturbance term is uncorrelated with the independent variables (Bollen, 1996). This requires that there is sufficient information about the economic behaviour being modelled by the specified variables in order to estimate (identify) the parameters of each equation. The 2SLS method can be applied to estimate unique parameter estimates for both exactly identified equations and over-identified equations. It replaces the (stochastic) endogenous explanatory variable with an estimated proxy variable that is a linear combination of all the predetermined variables in the model (and hence is uncorrelated with the stochastic disturbance term) and uses this combination as the explanatory variable in lieu of the original endogenous variable.

The 2SLS method thus resembles the instrumental variable method of estimation in that the linear combination of the predetermined variables serves as an instrument, or a proxy, for the endogenous variables. This technique completes the analysis in two stages. In the first stage, it computes the structural equations by regressing endogenous variables on all the predetermined variables in the system in which interdependence among variables is removed, because structural equations are those in which endogenous variables are expressed solely in terms of the predetermined variables and stochastic disturbances. As

such, the application of the OLS technique to the reduced form equation gives the structural or reduced form coefficients. These structural form coefficients are substituted in primary equations. The estimation of those equations again by OLS technique completes the second stage of the estimation and yields unbiased and consistent coefficients

A.7. Impact of trade on wages in the agriculture sector: methodology and data

To estimate the impact of trade on agricultural wages**,** data is collected from INDIAIHARVEST, which is a compiled database provided by C.M.I.E. The state-level wages of unskilled agricultural labour have been collected from the Department of Agriculture, Government of India.

Data on trade at the state level is not available. To estimate the state's share in total exports of an agricultural product, we apply the share of the state in total production of the product to its exports. This assumes that the share of the state in the exports of the product will be similar to its share in the production of the product. Similar estimates to construct the share of the state in total exports have been used by other studies, for example that of Marjit and Kar (2008). Imports of a particular agricultural product may affect labour more in the states that produce the product. Therefore, we take the state's share in the total production of the product and apply the ratio to total imports to arrive at the state's share in imports.

The analysis is carried out for four categories of agricultural products, namely (a) fruits and nuts; (b) vegetables, roots and tuber; (c) cereals; and (d) total agricultural products. The analysis is undertaken for the period 1990-91 to 1999-2000 (for which data on wages of unskilled agricultural labour was available), for 14 states of India.

Wage rate equation in agriculture

For the agriculture sector, the wages of unskilled agricultural workers differ across states, though not across crops. We therefore, undertake state-level analysis where wages of unskilled workers are influenced by the following factors:

$$\text{Ln } W_{it} = \beta_1 \ln W_{i,\,t-1} + \beta_0 X_{it} + \lambda_i + u_{it}$$

where W= wage rate, X = explanatory variables, λ_i = state-specific fixed effects

$$X_{it} = f(SDP_{it}, RAINFALL_{it}, SHAREAGRI_{it}, IRRIGATEDAREA_{it}, NOTRACTORS_{it}, FERT_{it}, MINWAGES_{it,} EXPORTS_{it}, IMPORTS_{it}, \text{State-specific fixed effects})$$

Where
SDP = State Domestic Product, RAINFALL = Average annual rainfall received, SHAREAGRI = Share of agriculture in total SDP, IRRIGATEDAREA = Extent of gross irrigated area in the state, NOTRACTORS = Number of tractors used, FERT = Amount

of fertilizers used, MINWAGES = Minimum wages of unskilled labour in the state, EXPORTS = Share of state in total exports of the product, IMPORTS = Imports of the product.

The equation to be estimated <u>for the agriculture sector</u> is therefore:

$$Ln(w/p)_{it} = F\ [\ Ln(w/p)_{it-1}\ ,\ LnSDP_{it}\ ,LnRAINFALL_{it};\ LnSHAREAGRI_{it}\ ,\ Ln\ IRRIGATEDAREA_{it}\ ,\ Ln\ NOTRACTORS_{it}\ ,Ln\ FERT_{it}\ ,Ln\ MINWAGES_{it}\ ,Ln\ EXPORTS_{it}\ ,\ Ln\ IMPORTS_{it}\ ,\ Fixed\ Effects$$

A.8 Empirical methodology: Impact of trade on the wages and employment of unskilled labour in organized manufacturing

A.8.1 Impact on the wages of unskilled labour in the organized manufacturing sector

Keeping in mind the unique characteristics of Indian labour markets and the important role played by the government in wage-setting, the wage equation is arrived at. It is assumed that labour supply is perfectly elastic at any given wage rate. In this case, wages will be fixed exogenously depending on the minimum wages fixed by the government and the bargaining power of labour unions.

In order to estimate the impact on employment, wage rigidities in the Indian labour market are taken into account, and dynamic panel data (DPD) models are constructed which are estimated using the Generalized Method of Moments (GMM) following Arellano and Bond (1991). GMM has become an important tool in empirical analyses of panels with a large number of individual units and a relatively short time series. This model can be written as

$$y_{it} = \alpha y_{i,t-1} + \eta_{i} + \nu_{it}$$

where $i=1,\ldots,N$; $t=2,\ldots,T$; $T \geq 3$ and $\alpha < 1$

For such models, the within group estimator (for the fixed effects models) and the Generalized Least Squares (GLS) estimator (for the random effects model) are not applicable. Therefore, the GMM estimator is applied. Adopting standard assumptions concerning the error components and initial conditions (i.e. error terms are not autocorrelated), Arellano and Bond (1991) propose moment conditions.[30] The validity of moment conditions implied by DPD models is commonly tested using the conventional GMM test of overidentifying restrictions, associated with Sargan (1958).

A.8.2 Data sources and construction of variables

For the manufacturing sector, no single source of data exists for the Indian economy that provides data required by this study. The study therefore draws data from two different sources, i.e. the *Annual Survey of industries* (ASI), which is published by the Central Statistical Organization, the Government of India and DGCI&S, for trade data. ASI provides reasonably comprehensive and reliable disaggregated estimates for the manufacturing industries. It covers all the production units registered under the Factories Act, 1948,[31] with the 'large ones' on a census basis (with the definition of 'large' changing over time) and the remaining ones on a sample basis. DGCI&S provides data at eight-digit level on HS 2002 codes. A concordance matrix is constructed to arrive at trade data at ASI three-digit industry-level NIC codes.

[30] For details, see Blundell and Bond (1998): 118.

[31] The Factories Act, it may be noted, applies to those units employing 10 or more workers and using electric power, or 20 or more workers not using electric power.

The data used in the study is constructed for 54 industries at three-digit level of industrial classification (National Industrial Classification) for the period 1998-99 to 2005-06.[32]

There are considerable problems in obtaining good-quality time series data on wages by skill level. The study uses the available information on wages contained in the ASI database. This source provides the average number of full-time production-process 'workers' and 'employees' (which includes, in addition to 'workers', non-production workers such as supervisors, clerks etc.) employed per day after taking account of reported multiple shift working. Wages of production workers is taken as wages of unskilled workers.

A.9 Impact of trade on labour productivity

For modelling labour productivity, we consider the CES production function with CRS.

$Q = \chi [s(k)-\rho + (1-s) (L e\lambda t)- e] -1/e$

Kmenta (1967) provides an alternative approach that allows single-equation estimation of the CES production function by ordinary least squares.[33] He obtains a linear approximation of the nonlinear CES function by expanding ln(Q) in a Taylor's series around $\rho=0$. Adopting the Kmenta approach, we estimate the following regression with respect to (a):

$\ln (Q) = \ln (\chi) + e^{\lambda t} \ln (K/L)+ \ln (L) + (\rho e^{\lambda t} (1-s)/ 2) [\ln (K/L)]^2$
$\ln (Q/L)_{it} = \ln (\chi)_{it} + e^{\lambda t} \ln (K/L)_{it} + (\rho e^{\lambda t} (1-s)/ 2) [\ln (K/L)]^2_{it}$
(Cobb-Douglas function assumes e = 0)

λ_t is taken as an exogenous technical change which may occur through different channels, such as FDI, trade, or technology acquisition, and which may affect the productivity of labour.

Labour productivity is therefore a function of

$(Q/L)_{it} = F [(K/L)_{it}, Q_{it}, , EXPORTS_{it}, IMPORTS_{it}, Time, Fixed Effects]……..(3)$

A.10 Impact of trade on wage inequality

[32] The period chosen has been constrained by the availability of comparable data from 1998 onwards, the reason being that ASI changed its industrial classification starting from 1998-99.

[33] Kmenta's approximation has some drawbacks, as demonstrated by McCarthy (1967). In particular, it is likely that the variables on the right-hand side are affected by a high degree of multicollinearity, increasing the standard error on the coefficient estimates and thus decreasing the value of the *t*-statistic.

To analyse the effect of trade on the market for skills, a demand and supply framework is used. Following Katz and Murphy (1992), a two-factor CES production function with low-skilled labour (U) and skilled labour (S) is used, as follows:

$$F(U_t, S_t) = [\chi(\delta_{ut} U_t)^{\rho} + (1-\chi)(\delta_{st} S_t)^{\rho}]^{1/\rho}$$

where, δ_{ut} and δ_{st} are functions of labour efficiency units and the parameter $\rho < 1$.

The labour efficiency index can be interpreted as accumulated human capital or the skill-specific technology level. Elasticity of substitution between U and S is $\sigma = 1/(1-\rho)$. In neoclassical theory, technological change happens exogenously. However, trade can also shift the pattern of technological change. The labour efficiency indices (skill-specific technological progress) depend on trade intensity (TRDI) [export intensity (EXPI) and import intensity (IMPI)] and technology (TECH).

Using the first-order condition that factor productivity equals the real factor price, the wages of skilled labour (W_{SK}) relative to those of unskilled workers (W_{USK}) can be represented as:

$$\ln(W_{SK} / W_{USK}) = \ln[(1-\chi)/\chi] - \frac{1}{\sigma}\ln(S_t / U_t) + (\sigma - 1/\sigma)\lambda_{1t} + (\sigma - 1/\sigma)\lambda_3 TRDI + (\sigma - 1/\sigma)\lambda_4 Tech$$

Given the downward rigidities in wages, especially for unskilled workers, it is found that the relative wages of skilled workers with respect to unskilled workers are a function of:

(Wages $_{skilled\ labour}$ / Wages $_{unskilled\ labour}$) = F [, Skilled labour /Unskilled labour, time, Imports, Exports, Technology]……..(4).

A.11 Methodology for estimating economy-wide gender employment

In order to estimate the impact of exports on gender employment across different sectors, we use the latest available input-output matrix for India for the year 2003-04. Using the employment coefficients and the change in output due to increased exports, the output and employment multipliers are derived for each sector over the period 2003-04 to 2006-07. Output multipliers indicate the total increase in output of the sector due to direct as well as indirect demand created because of exports in the economy. The employment multiplier of a sector indicates the increase in employment required in the sector to produce the increase in output demand.

The output multiplier of a sector is defined as the amount by which the total output increases for a unit increase in the output of that sector. It is usual to measure the unit change in INR lakh (00,000) or 0.1 million. Thus, if the output multiplier for a sector is 4, this implies that for every increase by INR 1 lakh (100,000) in the sectoral output, total output (that of the entire economy) increases by INR 4 lakh (400,000). That is an increase in total output of 0.4 million INR for every increase in sectoral output by 0.1 million INR. Similarly, the employment multiplier of a sector gives an estimate of the aggregate direct and indirect employment changes, in person-years, resulting from the increase in

INR 100,000 of output of that sector. Exports in each sector in 2006-07 have been deflated to remove any price effects.
Gender employment is generated by applying gender employment ratios to the increase in employment generated by the exports across sectors. The following are the sources used for gender-wise employment coefficients.

1) For plantation crops, the ratio of female to total employees is taken from Indian labour statistics for 2003-04.
2) For other crops, the estimates are based on the gender-wise workforce from the 2001 census. The same coefficients are used for food crops, cash crops and "other crops".
3) For minerals, the gender-wise estimates are based on *Statistics of Mines in India, vol. 1 (coal) and vol. 2 (other minerals)*, from the Indian Bureau of Mines.
4) For different sectors under manufacturing, the estimates are based on NSSO report no. 515 on "Employment and the unemployment situation in India, 2004-05". This source is also used to obtain estimates for animal husbandry, forestry, fishery, and other service sectors.

A.12 Methodology for estimating the impact of exports and imports on gender employment

In order to estimate the impact of exports and imports on gender employment in the Indian organized manufacturing industries, trade data is needed at the industry level. However, trade data is reported at the product level. Using a concordance matrix matching the six-digit HS codes (Harmonized System of Tariffs, 2002) with the three-digit NIC codes (National Industrial Classification), three-digit trade data at the ASI classification of industries is constructed. The industrial data reports the employment by gender. Using ASI data, the labour demand equation is estimated for men and women separately. Applying dynamic panel data techniques (Arellano-Bond model), we estimate the impact of the export intensity and import intensity of industries on gender employment. Using the same labour demand equation that was derived from the CES production function and reported in Appendix I (section A.7), the impact of trade on gender employment is estimated. Dynamic panel data estimations were discussed earlier.

Data and variables

To estimate the impact of exports and imports on gender employment, the concordance matrix (HS-NIC) to arrive at three-digit industry-level export and import data is used. The data on exports and imports have been taken from the World Integrated Trade Solution (WITS). The data on total persons engaged, total emoluments, gender employment, and capital formation is extracted from various issues of the Annual Survey of Industries (ASI) 2005-06. Data is drawn for 54 industries at a three-digit level of industrial classification (National Industrial Classification) for the period between 1999-2000 and 2004-05.

For estimation of the regression equations, a set of variables has been constructed using various data series. Assuming that the industry wage rate is common to both genders, it has been calculated by dividing the total emoluments by the total number of persons engaged in an industry. The wage series, as obtained, has been deflated with the WPI index to reflect the wage rates in real terms. Intensity of employment of women in an industry is calculated by dividing the number of women employed in an industry by the total employment in that industry. The gross value added (GVA) of industries is deflated with respective WPI series to reflect the values at constant (1993) prices. To capture the technological level across industries, a ratio of capital formation to labour is arrived at. Export and import intensities have been calculated to represent their respective shares in total output of the industry concerned.

A.13 Some methodological issues

While estimating the above equations in the study, there are three methodological issues that may arise:

- **I.** Issue of endogeneity and causality
- **II.** Use of trade volume variables rather than trade policy variables
- **III.** Exports may not generate new employment but may only lead to sectoral shifts in employment. This argument finds its basis from the assumptions of full employment in the H-O-S framework.

I. Issue of endogeneity and causality

In the equations estimating the impact of exports and imports on wages and employment, it may be argued by some that exports and imports may be endogenous variables in the production function and that the causality may be reversed and the dependent variable may cause trade. However, the actual volumes/value of exports and imports is now commonly being used in the literature on the interrelationship between growth, labour markets and trade liberalization, to proxy the effects of competition faced in the foreign markets and competition faced in the domestic markets (see Edwards in Journal of Economic Literature, 1993, and Milner and Wright, 1998).

The above approach used in the study is similar to that used by Greenaway, Hine and Wright (1999), which estimates a labour demand equation derived from the Cobb-Douglas production function. It uses exports and imports as independent variables in a panel framework using Arellano and Bond (1991) GMM techniques. There have been many other studies that use exports and imports as independent variables in the derived labour demand equation, initiated by the seminal paper of Griliches (1992), but also including Barrell and Pain (1997), Driffield and Taylor (2000), Driffield, Love and Taylor (2005), Milner and Wright (1994, 1998), Hine and Wright (1998), Giovanni et al.

(2003), Kletzer (2002), Bruno, Falzoni and Helg (2003), Taylor and Driffield (2005) and Fajnzylber and Maloney (2005).

Furthermore, methodologically, the use of GMM to a certain extent takes care of the endogeneity problem, as it uses the first lag of the independent variables as instruments.

On the question of causality of effect between trade and wages and employment, it may be pointed out that the H-O-S predictions are far from reality. Given the unlimited supply of labour in the developing countries, it is difficult to explain intersectoral differences in trade with respect to the available labour supply. On the other hand, trade may have a differential impact on sectoral employment depending upon the differences amongst them in the type of exposure they have to trade, firm-level heterogeneity within the sectors, differentiating products etc. Edwards (1993) provides an excellent survey of studies that have dealt with the problem of causality. At the centre of this approach is the idea that exports contribute to aggregate output in two fundamental ways: First, it is assumed that the export sector generates positive externalities on non-exports sectors, through more efficient management styles and improved production techniques. Second, it is argued that there is a productivity differential in favour of the export sector. Thus, an expansion of exports at the cost of other sectors will have a positive net effect on aggregate output and employment, and not the other way round.

II. Use of trade value variables rather than trade policy variables

Using trade values instead of trade policy variables may be questioned by some, as it could be argued that trade policy variables are exogenous in nature, whereas trade values (exports and imports) may not be exogenous variables as a host of determinants may affect them. The issue of exogeneity of trade volume variables has been discussed in the above section. However, the use of trade policy is subjected to the following limitations:

a) To capture the impact of trade on wages and employment, the most commonly used variable is import duties. However, these do not capture the effect of exports on wages and employment.

b) Many studies have emphasized that in developing countries, non-tariff barriers (e.g. quotas, licences and prohibitions) have traditionally constituted the most important form of restriction on trade. In the case of India, from 1947 to 2000, the main policy instrument for import regulation was quantitative restrictions (QRs). Use of tariff equivalence of QRs has many limitations, including with regard to gathering actual data on premiums, undertaking international price comparisons etc. Moreover, the QRs were at disaggregated product level, making it difficult to derive a meaningful industry-level QR.

c) Lowering of import duties may not by itself capture the change in imports that may arise, especially if there is low demand for the importable products.

d) Further, to capture the impact of exports, it is difficult to identify any appropriate sectoral policy variable which can be used as an instrument.

In view of these limitations, India's import duty may not be the appropriate variable for capturing the impact of trade on the poor.

III. Exports may not generate new employment, but may only lead to sectoral shifts in employment

It may be argued that the assumptions under the H-O-S framework are far from reality. Given the unlimited supply of labour in the developing countries, it is difficult to explain intersectoral differences in trade with respect to the available labour supply. On the other hand, trade may have a differential impact on sectoral employment, depending upon the differences among developing countries in the extent of exposure they have to trade, firm-level heterogeneity within the sectors, differentiating products etc. At the centre of this approach is the idea that exports contribute to aggregate output in two fundamental ways: First, it is argued that the exports sector generates positive externalities on non-exports sectors, through more efficient management styles and improved production techniques. Second, it is argued that there is a productivity differential in favour of the export sector. Thus, an expansion of exports at the cost of other sectors will have a positive net effect on aggregate output and employment, and not the other way round.

Further, it may be stated that there exists a long-standing debate on this issue between different schools of thought. Neoclassical economists recognize that, in the shorter run, the level of economic activity may be influenced by macroeconomic policy and shocks (money supply, fiscal policy etc.) as well as by trade shocks or major changes in trade policy, though they argue that in the long run, the labour market will clear in the absence of distortions. This is, essentially, the often-criticized "full employment" assumption. The structuralist school, on the other hand, rejects the long-run full employment assumption; see, for example, Ocampo and Taylor (1998). It postulates that trade and trade policy shocks can affect employment permanently, by creating or destroying jobs with little or no adjustment in the sectors of the economy not directly affected by shocks. Both theorists and empiricists have explored the connection between trade/trade policy and employment, and have arrived at varied results, which are country-specific.

APPENDIX II

II.1 The social accounting matrix

A SAM (social accounting matrix) can be defined as an organized matrix representation of all transactions and transfers between different (production) activities, factors of production (labour and capital), and institutions (e.g. households, firms, and government), actual or imputed, within the economy and with respect to the rest of the world. A SAM is thus a comprehensive accounting framework within which the full "circular flow of income" is captured, from production to value added (factor income) to household incomes to household demand and back to production. Each row of the SAM details the receipts of an account, while the columns detail the corresponding expenditure. Consequently, the number of rows and columns in a SAM are the same, and hence it is a square matrix. An entry in row i and column j of the SAM denotes the receipts of account i from column j. This may alternatively be expressed as the expenditure by account j to be paid to account i.

A SAM has manifold uses. First, a SAM can be used to provide an analysis of the interrelationship between the production structure of an economy and the distribution of income and expenditure among different household groups. Second, the SAM can be supplemented with satellite tables (e.g. those distinguishing various categories of employed persons), thus providing a flexible and yet consistent framework for socio-economic analysis. Third, SAMs have been used as the database (and base-year equilibrium benchmark) of computable general equilibrium (CGE) models; these models are widely used to estimate the effects on growth and income distribution of a range of policies, from trade liberalization policies to tax rate changes and structural adjustment programmes. Fourth, development planners, statistical bureaus and economic modellers increasingly use the SAM as an approach to macroeconomic data systems. The great usefulness of the SAM approach is that it brings out any inconsistencies, gaps and redundancies in the statistical system of an economy.

Finally, the SAM can be used as the basis for simple modelling under certain assumptions. Using the SAM, one can assess, by means of multipliers and structural path analysis, the economy-wide consequences – for production, income distribution and demand – of exogenous changes such as a change in public investment expenditure, a change in export demand, and the introduction of a new public system of income transfers. In this study, we use this property of the SAM to work out the potential effects of changes in service sector exports. We do this by using the "multipliers" associated with exogenous change. The SAM multipliers measure the total effects on output, employment or value added, given an increase in exogenous injections.

The basic structure of a SAM is based on the transactions and transfers in the economy given in Table 9. The production process requires land, labour and capital, along with intermediate goods and services. Institutions such as households, firms and the government contribute the factor endowments. These institutions, in turn, receive factor payments as value added. Apart from value added, institutions receive income from other sources, such as transfers from the government and from the rest of the world. Income is spent as consumption expenditure on goods and services and for payment of taxes. The rest is saved for the future. The total supply in the economy has to be matched by the demand by the institutions and through capital formation in the form of the purchase of investment goods. In the SAM, the household consumption expenditure is broken down to reflect the role that different levels of households play in the economy. The schematic structure of a SAM presented here is made up of five major accounts: production, factors, institutions, capital, and rest of the world (ROW) accounts. These concepts are explained below.

The production account consists of two parts: activities (industries) and commodities. The activity account is the "make matrix". Each row in this matrix gives the distribution of the output of different commodities produced by the industry in that row. Each column in this matrix gives the value of output of the commodity in that column produced by different industries (A1.2). On the other hand, industry purchases goods and services in the form of commodities (A2.1), hires factor services in the form of labour and capital (A3.1) and pays indirect taxes towards the purchase of goods and services (A8.1). This matrix in total is called the absorption matrix.

The aggregate supply in the economy consists of imports in addition to commodities produced by industries (A10.2). This supply of commodities, in addition to meeting the intermediate demand of industries, meets the requirements of the components of the final demand. The components of final demand are households (A2.4), government (A2.7), gross fixed capital formation (A2.9) and exports (A2.10).

Factors receive value added, in (A3.1), as a payment for their services, which is otherwise known as gross domestic product (GDP) at factor cost, net of indirect taxes on activities. They also receive net factor income from abroad (A3.10). This total value added, GDP plus net factor income from abroad, is termed as gross national product (GNP) at factor cost. Since institutions provide factor services, income is either remitted abroad or accrues to domestic institutions. Hence, the total GNP at factor cost is distributed as:

(1) Factor income to households (A4.3);
(2) Operating profits of the private corporate sector (A5.3);
(3) Operating surplus of public non-departmental enterprises (A6.3); and
(4) Income from entrepreneurship to government (A7.3).

The gross national product is the primary source of income for these institutions. In addition to the value-added income, other sources of income for households are government transfers and interest on public debt (A4.7), and net current transfers from abroad (A4.10). Column 4 in the table records household spends from its income through consumption expenditure, direct taxes (A7.4) and indirect taxes on purchases (A8.4). The

residual income is kept as savings (A9.4). Apart from operating profit, the other source of income for the private corporate sector is interest on public debt from the government (A5.7). The private corporate sector pays corporate taxes (A7.5) out of its earnings and saves (A9.5). Value added is the only source of earning for the public non-departmental enterprises. The only entry in Column 6 is that of public-sector savings (A9.6), to match with total public-sector earnings.

Column 7 and row 7 balance the government's budget. Receipts of the government consist of income from entrepreneurship (A7.3), direct taxes (A7.4) and (A7.5), and indirect taxes (A7.8). On the other hand, its outlay includes its final consumption expenditure on goods and services (A2.7), its transfers to institutions (A4.7) and (A5.7), and indirect taxes on purchases (A8.7). The residual government saving (A9.7) balances the budget.

The capital account represents the aggregate capital account of all institutions in the economy. It defines the savings and investment closure of the economy. Column 9 of the capital account shows the investment demand in the economy. It has gross domestic capital formation inclusive of changes in stocks (A2.9), and indirect taxes on purchase of investment goods (A8.9). Row 9 indicates the sources of savings in the economy, including aggregate capital depreciation in the economy, i.e. consumption of fixed capital (A9.3). Households, private corporations, the public sector and government contribute to domestic savings. These are net domestic savings. When added to depreciation, this becomes gross domestic savings. The foreign savings or the current account balance (A9.10) matches the difference between total investment inclusive of indirect taxes and gross domestic savings.

Here, it is worth mentioning that the capital account can be detailed by dividing the institutions into the current account of institutions and the capital account. The capital account in this case represents the source of funds and their use in a detailed manner. The external sector can also have current as well as capital accounts in order to differentiate between merchandise trade balance and flow of capital.

It should be noted that international transfers, along with the current account balance, must finance the difference between imports and exports in the external closure. Transactions between the domestic economy and the rest of the world are represented by column 10 and row 10. Total foreign exchange inflows for the country come from exports (A2.10), net factor income (A3.10), net current transfers (A4.10), and net capital transfers from abroad (A7.10). Total imports represents the foreign exchange outflow from the country to the rest of the world (A10.2). The difference between the foreign exchange receipts and outflow, after paying the export taxes (A8.10), gives us the net foreign exchange reserve as foreign savings (A9.10).

The SAM constructed here is for the financial year 2003-04 and consists of 46 production sectors, two factors of production and five household classes by expenditure levels separately for rural and urban areas. It is important to note that this is the first SAM that gives household classes by expenditure levels. The major steps involved in the construction of this SAM are updating of the available 1998-99 Input-Output (I-O) table for the year 2003-04, division of sector-wise value added into wage and non-wage income and

distributing the aggregates among different institutions, and distribution of personal income and expenditure among different household categories.

II.2 Methodology of construction of SAM

Since the I-O table (matrix) is an important part of SAM, it is essential to understand the methodology of construction of the I-O table too. The Central Statistical Organization (CSO) has been constructing I-O tables since 1973-74, at an interval of 5 years. The latest available table is for 1998-99. The methodology of construction of the table is given by the CSO (2005). In order to construct the I-O (symmetric commodity by commodity) table, the first step is to construct two tables: the absorption table (also called the use table) and the make matrix (also called the supply table). CSO (2005) gives the methodology and data sources for these matrices. Since we are in the 2003-04 SAM, the absorption as well as the make matrices have been updated to 2003-04.

II.3 Updating I-O for 2003-04

For 2003-04, the economy is divided into 46 producing sectors. First, the 115-sector 1998-99 absorption matrix, and the make matrix, are aggregated to 46 sectors. The value added and values of output are estimated for these 46 sectors. Wherever feasible, inputs are directly estimated from various sources. The remaining estimates are based on the 1998-99 absorption matrix, except for the relative price changes. The make matrix for 2003-04 is obtained by using the 1998-99 make matrix and the RAS methodology for making adjustments. The sector-wise ratios of commodities to industry output of 1998-99 are assumed for 2003-04. (For details of the RAS methodology, see Pradhan et al., 2006). The sources, the methods used, the assumptions made, and the problems encountered in estimating the inputs, outputs, and final demand components are discussed in the following paragraphs.

II.4 Production sectors

Agriculture (sectors 1 to 4):
The crop-wise estimates of the value of output as available from the National Accounts Statistics (NAS, 2005) for the years 1998-99 and 2003-04 are used to get the values of output of different sectors under agriculture. The growth indices of values of production for 2003-04 (with 1998-99 as the base) are first computed and then applied to the commodity, as well as the industry output of the 1998-99 I-O table, in order to get sector-wise values of output for 2003-04. The directly available values of output of different crops are not used, because some of the sectors in the I-O table, such as cereals, are inclusive of milling. It is assumed that the ratio of these activities to the output of crops for each sector will be the same for 1998-99 and 2003-04.

The major inputs of agriculture are seed, organic manure, fertilizers, electricity, pesticides, diesel oil and animal services. These inputs are estimated for the entire agriculture sector as a whole. In the case of pesticides, fertilizers and organic manure, the inputs are based on their availability. For diesel oil and electricity, the growth in the

inputs from 1998-99 to 2003-04 (as obtained from the NAS) is used, and sector-wise inputs are first calculated by using 1998-99 ratios. The totals of inputs thus obtained are pro-rata adjusted to get the control totals. For other minor inputs, trade and transport margins, and indirect taxes, the 1998-99 coefficients are used directly.

Animal husbandry (sector 5):
There are three sectors under animal husbandry: (a) milk and milk products; (b) animal services; and (c) other livestock products. The NAS gives the estimates of value-added of the animal husbandry sector, and also the item-wise values of output of this sector. The value of output of animal services is equal to the value of its inputs consumed by other sectors of the economy (agriculture). For 1998-99, the total inputs consumed by animal husbandry are slightly higher than the cost of feed given in the NAS (because of repair and maintenance etc.). For 2003-04, the total of inputs is obtained by using the 2003-04 cost of feed given in the NAS and the 1998-99 ratio of total inputs to the cost of feed. The distribution of the total inputs is done on the basis of 1998-99 distributions.

Forestry and fishery (sectors 6 and 7): For these two sectors, the gross value-added and value of output are both taken from the NAS. The distribution of inputs for 1998-99 is assumed for 2003-04.

Mining (sectors 8 to 11):
The item-wise values of output and group-wise value-added are available from the NAS. The distribution of value-added within a group is done by making use of 1998-99 value-added to value-of-output ratios, where the 2003-04 group-wise value-added is taken as the total. The 1998-99 distribution of inputs is assumed for 2003-04.

Manufacturing industries (sectors 12 to 29):
There are 18 sectors under manufacturing. Ten of these sectors are ones for which gross value added (GVA) is available from NAS 2005, at two-digit-level classification, for 1998-99 and also 2003-04. For these 10 sectors, the growth of GVA between 1998-99 and 2003-04 is applied to the GVA of these sectors in the 1998-99 absorption matrix, to obtain the GVA of sectors for 2003-04. It is assumed that the GVA to gross value of output (GVO) for these manufacturing sectors will be the same for 1998-99 and 2003-04. Also, the commodity to industry output ratios for all sectors will be the same for these two years. For the remaining sectors, the growth rates in the GVA and the GVO between 1998-99 and 2003-04, based on their values from the Annual Survey of Industries (ASI), are applied to the GVA and GVO in the 1998-99 absorption matrix. The 1998-99 input structure with relative price change is assumed for 2003-04.

Relative price adjustment of the CxI (1998-99) matrix has been carried out by first constructing a price index of 2003-04 over 1998-99 for the 46 sectors mentioned above, and then multiplying the index with the corresponding rows of the constructed 46 sectors (CxI matrix). Price indices have been constructed by taking values of output from the NAS. Price increases (VOP current prices/VOP (1993-94) constant prices) are calculated for 1998-99 and 2003-04, and then the change (2003-04 over 1998-99) in prices is calculated. This is done for the primary sectors. For the manufacturing sectors,

price indices are taken as the growth in WPI from 1998-99 and 2003-04. For sectors for which output is not available, GDP is used for calculating price indices. For Gas and Water Supply, Trade, Hotels and Restaurants, Transport by Other Means, Storage, Banking and Insurance, Education and Research, Medical and Health, Other Services, and Public Services, we have used GVA for getting price indices.

Other sectors (sectors 30 to 46):
The data on value added from these sectors is directly taken from the NAS. For some sectors, such as construction, communications, railways etc., the values of output are directly available from the NAS. For the rest, the values of output, as well as the values of input, are obtained by using the 1998-99 I-O structures.

II.5 Make matrix

The make matrix for 2003-04 is obtained by using the industry output control totals and the make matrix of 1998-99. As already mentioned, the sector-wise commodity outputs are obtained from the industry output by making use of their proportions in 1998-99. By using the industry and commodity outputs of 2003-04, and the make matrix of 1998-99, the make matrix for 2003-04 is obtained, by applying the RAS method. Some minor adjustments are made mechanically in the commodity outputs to get the consistent matrix.

II.6 Final demand

Private Final Consumption Expenditure (PFCE):
CSO supplied us with the values of PFCE at detailed item level for 1998-99 and 2003-04. These items were grouped into our sectors, and the growth rates between 1998-99 and 2003-04 obtained from this data were applied to the PFCE for these sectors for 1998-99 in order to get the estimates for 2003-04. For a few sectors, however, we could not directly obtain the growth rates. In such cases, the increase in the value of output is assumed for increase in PFCE. The total PFCE obtained by this method comes to about 4% higher than the corresponding estimate given in the NAS. It may be mentioned here that in the 1998-99 I-O table also, the estimate of PFCE is higher than that given in the NAS by about the same magnitude.

Government Final Consumption Expenditure (GFCE):
Total expenditure on goods and services, as given in the NAS, is divided into different sectors by assuming the 98-99 I-O structure with some adjustments in the education and medical and health sectors because of higher growth in their value added. Because of the adjustments in these two sectors, the total expenditures are slightly higher than those given in the NAS.

Imports and Exports:
Imports are at CIF prices, while exports have been converted into factor cost prices. Like PFCE, the indices of growth have been worked out and used for imports as well as exports. These growth rates are based on the data available from CMIE on merchandise

imports and exports at eight-digit level. In addition to merchandise, the foreign trade consists of transport, communications, insurance etc. The growth rates between 1998-99 and 2003-04 in these service sectors are based on the data available from NAS 2005. The values of total imports and exports are higher than those given in the NAS. There were similar types of differences in the 1998-99 I-O table, too.

Gross Fixed Capital formation (GFCF):
GFCF is available from the NAS for construction, and machinery and equipment. The capital formation from construction is obtained by subtracting inter-industrial consumption and GFCE from the total value of output. The estimate obtained in this way is slightly different from the estimate given in the NAS. For capital formation from animal husbandry, the index of growth of increment to livestock is applied to the capital formation as given in the 1998-99 I-O table. For other sectors, including trade, transport, and indirect taxes, the remaining capital formation is distributed among different sectors by using the 1998-99 structures. According to the NAS, there is a huge margin of error, of about 14 per cent, between estimates based on type of assets and those based on domestic savings. In the I-O table, the estimates match according to type of assets. It may be mentioned here that the margin of error for 1998-99 was 5.6 per cent, whereas it was less than 2 per cent for 2001-2002. CSO in 1998-99 had adjusted this margin of error in the estimates for GFCF. However, we could not adjust such a huge difference.

Change in Stocks (CIS):
No details are available regarding the CIS. In most of the sectors, the CIS is a balancing entry and cannot be considered as actual changes in stocks. Even in the 1998-99 tables, at number of places, the CIS seems to be a balancing entry. For service sectors, the differences in the output and the total of intermediate and final demands are pro-rata adjusted among various production sectors. In some sectors, the values are relatively very high. For example, in furniture and wood products, the increase in value added according to the NAS is very small.

According to CSO, there is a substantial increase in PFCE and in inter-industry consumption because of increases in the output of sectors consuming wood and wood products. As a result, there is a huge negative value under CIS. There is no CIS in services sectors except for electricity, gas and water supply, where we could not distribute the difference between supply and demand and there are non-zero values under these sectors.

II.7 Extension of I-O for the construction of SAM

This subsection deals with the methodology and the data sources for division of gross value added into wage and non-wage income, and of PFCE and personal income into economic categories/expenditure classes of households.

Wage and non-wage income:

The division of the gross value added into wage (including imputed) and non-wage income has been done for 46 sectors of the economy for 2003-04, into which the 115-sector I-O table has been aggregated. The sources of data and methods used are given below, by broad sectors of the economy.

Agriculture and allied activities and mining:

The NAS gives the breakdown of the net value added (NVA) into compensation to employees (CE) and operating surplus/mixed income separately for organized and unorganized components of agriculture and animal husbandry. From 1980-81 to 1989-90, the NAS has broken up mixed income into income of family labour and operating surplus (CSO, 1994). By using the proportions of 1989-90, we have divided the mixed income of 2003-04 into the above two categories. Wage income due to family labour, obtained this way, has been added to the actual wage income from the organized and unorganized components to get the total income due to labour. The remaining part of the net domestic product is the operating surplus. The same proportions have been used for the four sectors under agriculture.

The NVAs, for these sectors, have been obtained from the corresponding GVAs by using the depreciation to GVA ratio for the entire agriculture sector, as available from the NAS. For forestry, fishing, and all the four sectors of mining, the mixed income in the unorganized part is divided into wage income and operating surplus, using the same ratio as in agriculture. The total value added in each of these sectors is divided into its components by applying the same method as used for agriculture. For mining, the NVA from the unorganized part is only about 7 per cent.

Manufacturing industries:

The output of manufacturing industries comprises the outputs of the registered and the unregistered sectors. For the registered sector, the GVA at two-digit level of industrial classification for 2003-04 given in the NAS is divided into wage and non-wage income on the basis of the ASI data for 2003-04. For unregistered manufacturing, the 2000-01 estimates of GVA, emoluments, and number of hired and total workers are available for manufacturing establishments. These are used to get the estimates for the unorganized sector. For self-employed workers, the imputed values based on the data for hired workers are used. Using the proportions of different components of GVA for 2000-01 for the unorganized sectors to the 2003-04 GVA of the unorganized sector, we get, at two-digit level, the components of GVA. Adding these values for the registered and unregistered sectors, we obtain, at two-digit level, the components of the GVA for the entire manufacturing sector. Using the ratios for each two-digit-level industrial group for all the sectors under that group, we get the wage and non-wage incomes for different sectors under manufacturing.

Trade; Hotels and restaurants and transport; Storage and other services; etc.:

For the organized parts, the estimates of wage and non-wage income are available from the NAS. For the unorganized parts, the wage components are directly estimated by making use of the follow-up surveys of the economic censuses in a way similar to that used for the unorganized manufacturing sector.

Electricity, gas and water supply:

The NDP from the electricity sector is divided between consumption expenditure and operating surplus on the basis of their ratios for the organized part of the combined sector, i.e. electricity, gas and water supply, available from the NAS. By deducting the wage and non-wage components of the electricity sector from the corresponding components of the combined sector, we get those components for the organized "gas and water supply" sector. Besides, the entire mixed income under the unorganized "gas and water supply" sector is assumed as wages, as the mixed income is mainly from "gobar gas" and not much capital is involved in it.

Banking and insurance:

A very small portion of the value added under banking is from the unorganized part. This is shown against mixed income and income that has been assumed to be non-wage income, as a major part of the activity under the unorganized segment is that of moneylenders. In moneylending, mainly capital is involved, and in general, moneylenders carry out other activities as well.

Ownership of dwellings:

The NVA is available from the NAS for the combined sector of real estate, ownership of dwellings and business services. The GVA, however, is available separately for these sectors. As the depreciation is proportionately more in the case of ownership of dwellings, the NVA cannot be divided among these three sectors on the basis of their GVAs. We have arbitrarily assumed the depreciation to be 10% of the GVA in case of both real estate and business services. As real estate and business services form part of the "other services", the NVA thus obtained is divided into wage and non-wage income based on the ratio obtained from the "other services" sector. As ownership of dwellings is mainly in the unorganized sector, the total NVA for this sector is divided into wage and non-wage income by assuming the same ratios as in the unorganized component of the combined sector and assuming the entire mixed income as the non-wage income.

Construction:

The whole of mixed income, except the interest charges, under the unorganized sector, is assumed as wage income. For the organized sector, the wage and non-wage incomes are available separately from the NAS.

Table II.1
Schematic structure of a Social Accounting Matrix (SAM)

		Activities	Commodities	Factors	Households	Private corporate sector	Public enterprises	Government	Indirect taxes	Capital account	Rest of world	Total
		1	2	3	4	5	6	7	8	9	10	
1	Activities		Gross output A1.2									Output
2	Commodities	Purchase of raw materials A2.1			Household consumption A2.4			Government consumption A2.7		Gross fixed capital formation A2.9	Exports A2.10	Aggregate demand
3	Factors	Value added A3.1									Net factor income A3.10	Factor income
4	Households			Endowment of households A4.3				Govt. transfer, interest on debt A4.7			Net current transfer A4.10	Total household income
5	Private corporate sector			Operating profits A5.3				Interest on debt A5.7				Income of private corporate sector
6	Public enterprises			Operating surplus A6.3								Income of public corporate sector
7	Government			Income from enterprises A7.3	Income tax by households A7.4	Corporate taxes A7.5			Total indirect taxes A7.8		Net capital transfer A7.10	Total government earnings
8	Indirect taxes	Taxes on intermediate A8.1			Taxes on purchases A8.4			Taxes on purchases A8.7		Taxes on investment goods A8.9	Tax on exports A8.10	Total indirect taxes
9	Capital account			Depreciation A9.3	Household savings A9.4	Corporate savings A9.5	Public sector savings A9.6	Government savings A9.7			Foreign savings A9.10	Gross savings of economy
10	Rest of world		Imports A10.2									Foreign exchange payments
	Total	Total cost of production	Aggregate supply	Total factor endowments	Total use of household income	Private corporate income	Income of public corporate	Aggregate government expenditures	Total indirect taxes	Aggregate investment	Foreign exchange receipts	

							sector					